

How to use this file...(Operators Manuals)

Instructions for **Print Vendors (Paper Manuals)**

- Paper Size:**
- * 11 x 17
 - * Body—50 lbs brilliant white offset or equivalent.
 - * Cover—on pre-printed two-tone “Swash” stock.
- Press:**
- * Body—1-color, 2-sided
 - * Cover imprint —1-color, 1-sided
- Bindery:**
- * Saddle Stitch, Face Trim, 3-Hole Drill
 - * Face Trim
- COVERS:**
- * **This file contains several manuals, which differ only in their covers.**
 - * Covers are all present at the beginning of this file.
 - * Back cover for a particular manual is the page IMMEDIATELY AFTER the front cover.
 - Check the front cover for the individual part number (typically a 171xxxx number).
- BODY:**
- **The body of the manual is identical, regardless of the cover used.**
 - * REMEMBER: ODD number pages are ALWAYS right hand pages, and EVEN number are ALWAYS left hand pages.
- General:**
- * **This instruction page is NOT part of the manual and must NOT be printed.**
 - Pages labeled with the text “THIS PAGE INTENTIONALLY BLANK” are placement pages ONLY, and should NOT be printed.
-

If you have further questions on how to utilize this file, please contact
Simplicity Technical Publications Department at (414) 284-8650.

THIS PAGE INTENTIONALLY BLANK



OPERATOR'S MANUAL



Express Series

14.5HP Gear Tractors

Mfg. No.	Description
1693452	Express, 14.5 HP Gear

15.5HP Hydro Tractors

Mfg. No.	Description
1693458	Express, 15.5 HP Hydro

38" Mower Decks

Mfg. No.	Description
1693464	38" Mower Deck



Simplicity

MANUFACTURING, INC.
500 N Spring Street / PO Box 997
Port Washington, WI 53074-0997

www.simplicitymfg.com
www.allislawn.com
www.masseylawn.com

© Copyright 1999 Simplicity Manufacturing, Inc.
All Rights Reserved. Printed in USA.



Table of Contents

Identification Numbers	2	Troubleshooting, Adjustments & Service	24
Safety Rules & Information	3	Troubleshooting the Tractor	24
Features & Controls	6	Troubleshooting the Mower	25
Control Functions	6	Seat Adjustment	26
Safety Interlock System Test	7	Steering Gear Adjustment	26
Operating the Tractor	8	Brake & Brake Spring Adj. - Hydro Models	26
General	8	Brake & Brake Spring Adj. - Gear Models	27
Checks Before Starting	8	Mower Adjustments	27
Clutch/Brake Pedal Operation	9	PTO Clutch Adjustment	27
Starting the Engine	9	Leveling the Mower	28
Stopping the Tractor & Engine	9	Blade Brake Check	29
Driving the Tractor	10	Mower Belt Replacement	30
Mowing	10	38" Mowers	30
Pushing the Tractor by Hand	11	Tractor Drive Belt Replacement - All Models	31
Mower Deck Removal & Installation	12	Battery Service	32
Removing the Mower Deck	12	Checking the Battery Voltage	32
Installing the Mower Deck	13	Charging A Discharged Battery	32
Mower Cutting Height Adjustment	13	Jump Starting with an Auxiliary Battery	32
Storage	14	Transmission Purging	34
Regular Maintenance	15	Specifications	35
Maintenance Schedule	15	Common Replacement Parts	36
Raising the Hood & Seat	16	Lawn Care & Mowing Information	LC—1
Checking/Adding Fuel	16	International Symbols	LC—8
Checking Tire Pressures	16	Technical Manuals	LC—8
Check / Replace Fuel Filter	17		
Engine Maintenance	17		
Blade Brake Check	17		
Safety Interlock System Check	17		
Gear Transmission Service	18		
Hydro Transmission Service	18		
Exhaust Screen Service	19		
Battery Maintenance	19		
Lubrication	20		
Lubricate Rear Axes	21		
Servicing the Mower Blades	22		
Maintenance Records	23		

NOTE: In this manual, "left" and "right" are referred to as seen from the operating position.



WARNING

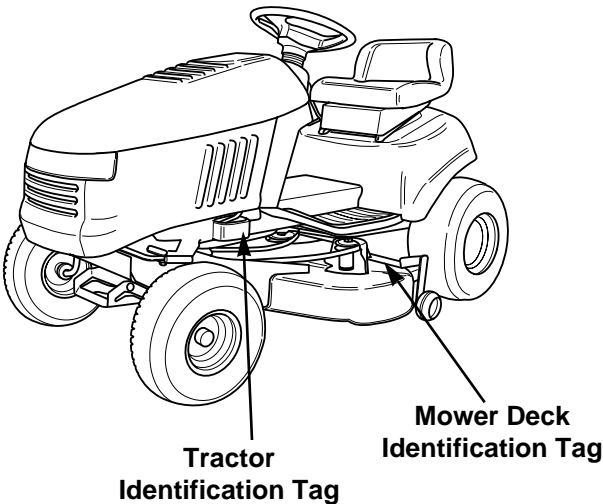
Engine exhaust from this product contains chemicals known, in certain quantities, to cause cancer, birth defects, or other reproductive harm.

Identification Numbers



IDENTIFICATION TAG LOCATIONS

When contacting your Authorized Dealer for replacement parts, service, or information **YOU MUST HAVE THESE NUMBERS.**



IDENTIFICATION NUMBERS

Record your model name / number and mower deck manufacturer numbers and engine serial number in the space provided for easy reference.

- The **Tractor I.D. tag** is located on the left-side, of the frame, as shown below.
- The **Mower Deck I.D. tag** is also on the left side, on top of the mower deck.
- For location of **Engine Serial Number**, refer to the Engine Owner's Manual.


Be sure to fill out and return the Warranty Registration Card supplied with your unit.

PRODUCT REFERENCE DATA	
Model Description Name/Number	
Tractor MFG Number	Tractor SERIAL Number
Mower Deck MFG Number	Mower Deck SERIAL Number
Dealer Name	Date Purchased
ENGINE REFERENCE DATA	
Engine Make	Engine Model
Engine Type/Spec	Engine Code/Serial Number



Safety Rules & Information



Read these safety rules and follow them closely. Failure to obey these rules could result in loss of control of unit, severe personal injury or death to you, or bystanders, or damage to property or equipment. **This mower deck is capable of amputating hands and feet and throwing objects.** The triangle  in text signifies important cautions or warnings which must be followed.

GENERAL OPERATION

- Read, understand, and follow all instructions in the manual and on the unit before starting.
- Only allow responsible adults, who are familiar with the instructions, to operate the unit.
- Clear the area of objects such as rocks, toys, wire, etc., which could be picked up and thrown by the blade(s).
- Be sure the area is clear of other people before mowing. Stop unit if anyone enters the area.
- Never carry passengers.
- Do not mow in reverse unless absolutely necessary. Always look down and behind before and while travelling in reverse.
- Be aware of the mower discharge direction and do not point it at anyone. Do not operate the mower without either the entire grass catcher or the deflector in place.
- Slow down before turning.
- Never leave a running unit unattended. Always disengage the PTO, set parking brake, stop engine, and remove keys before dismounting.
- Disengage the PTO lever to stop the blades when not mowing.
- Stop engine before removing grass catcher or unclogging chute.
- Mow only in daylight or good artificial light.
- Do not operate the unit while under the influence of alcohol or drugs.
- Watch for traffic when operating near or crossing roadways.
- Use extra care when loading or unloading the unit into a trailer or truck.
- Data indicates operators, age 60 and above, are involved in a large percentage of riding mower related injuries. These operators should evaluate their ability to operate the riding mower safely enough to protect themselves and others from serious injury.

SLOPE OPERATION

Slopes are a major factor related to loss-of-control and tip-over accidents, which can result in severe injury or death. **All slopes require extra caution. If you cannot back up the slope or if you feel uneasy on it, do not drive on it.**



WARNING

Never operate on slopes greater than 30 percent (16.7°) which is a rise of three feet vertically in 10 feet horizontally.

When operating on slopes that are greater than 15 percent (8.5°) but less than 30 percent use additional wheel weights or counterweights when available and applicable (see your dealer to determine which weights—if any—are available and appropriate for your unit).

Select slow ground speed before driving onto slope. In addition to front and rear weights, use extra caution when operating on slopes with rear-mounted grass catcher.

Mow UP and DOWN the slope, never across the face, use caution when changing directions and DO NOT START OR STOP ON SLOPE.

Do

- See your authorized dealer for recommendations of available weights to improve stability.
- Mow up and down slopes, not across.
- Remove obstacles such as rocks, tree limbs, etc.
- Watch for holes, ruts, or bumps. Uneven terrain could overturn the unit. Tall grass can hide obstacles.
- Use slow speed. Choose a low gear so that you will not have to stop or shift while on the slope.
- Use extra care with grass catchers or other attachments. These can change the stability of the unit.
- Keep all movement on the slopes slow and gradual. Do not make sudden changes in speed or direction.

Do Not

- *Do not* start or stop on a slope. If tires lose traction, disengage the blade(s) and proceed slowly straight down the slope.
- *Do not* turn on slopes unless necessary, and then, turn slowly and gradually uphill, if possible.
- *Do not* mow near drop-offs, ditches, or embankments. The mower could suddenly turn over if a wheel is over the edge of a cliff or ditch, or if an edge caves in.
- *Do not* mow on wet grass. Reduced traction could cause sliding.
- *Do not* try to stabilize the unit by putting your foot on the ground.
- *Do not* use grass catcher on steep slopes.

Safety Rules & Information

CHILDREN

Tragic accidents can occur if the operator is not alert to the presence of children. Children are often attracted to the unit and the mowing activity. Never assume that children will remain where you last saw them.

- Keep children out of the mowing area and under the watchful care of another responsible adult.
- Be alert and turn unit off if children enter the area.
- Before and during reverse operation, look behind and down for small children.
- Never carry children. They may fall off and be seriously injured or interfere with safe unit operation.
- Never allow children to operate the unit.
- Use extra care when approaching blind corners, shrubs, trees, or other objects that may obscure vision.

TRANSPORTING AND STORAGE

- Always observe safe refueling and fuel handling practices when refueling the unit after transportation or storage.
- Always follow the engine manual instructions for storage preparations before storing the unit for both short and long term periods.
- Always follow the engine manual instructions for proper start-up procedures when returning the unit to service.
- Never store the unit or fuel container inside where there is an open flame or pilot light, such as in a water heater. Allow unit to cool before storing.

SERVICE AND MAINTENANCE

- Use extra care in handling gasoline and other fuels. They are flammable and vapors are explosive.
 - a) Use only an approved container.
 - b) Never remove gas cap or add fuel with the engine running. Allow engine to cool before refueling. Do not smoke.
 - c) Never refuel the unit indoors.

- Never run a unit in an enclosed area.
- Keep nuts and bolts, especially blade attachment bolts, tight and keep equipment in good condition.
- Never tamper with safety devices. Check their proper operation regularly.
- Keep unit free of grass, leaves, or other debris build-up. Clean up oil or fuel spillage.
- Stop and inspect the equipment if you strike an object. Repair, if necessary, before restarting.
- Never make adjustments or repairs with the engine running unless specified otherwise in the engine manufacturer's manual.
- Grass catcher components are subject to wear, damage, and deterioration, which could expose moving parts or allow objects to be thrown. Frequently check components and replace with manufacturer's recommended parts, when necessary.
- Mower blades are sharp and can cut. Wrap the blade(s) or wear gloves, and use extra caution when servicing them.
- Check brake operation frequently. Adjust and service as required.
- Use only factory authorized replacement parts when making repairs.
- Always comply with factory specifications on all settings and adjustments.
- Only authorized service locations should be utilized for major service and repair requirements.
- Never attempt to make major repairs on this unit unless you have been properly trained. Improper service procedures can result in hazardous operation, equipment damage and voiding of manufacturer's warranty.

WARNING

Never place hands near the hydro pump cooling fan when the unit is running. Cooling fan is located on top of transaxle.

SAFETY DECALS

This unit has been designed and manufactured to provide you with the safety and reliability you would expect from an industry leader in outdoor power equipment manufacturing.

Although reading this manual and the safety instructions it contains will provide you with the necessary basic knowledge to operate this equipment safely and effectively, we have placed several safety labels on the unit to remind you of this important information while you are operating your unit.

All DANGER, WARNING, CAUTION and instructional messages on your rider and mower should be carefully read and obeyed. Personal bodily injury can result when these instructions are not followed. The information is for your safety and it is important! The safety decals below are on your rider and mower.

If any of these decals are lost or damaged, replace them at once. See your local dealer for replacements.

These labels are easily applied and will act as a constant visual reminder to you, and others who may use the equipment, to follow the safety instructions necessary for safe, effective operation.



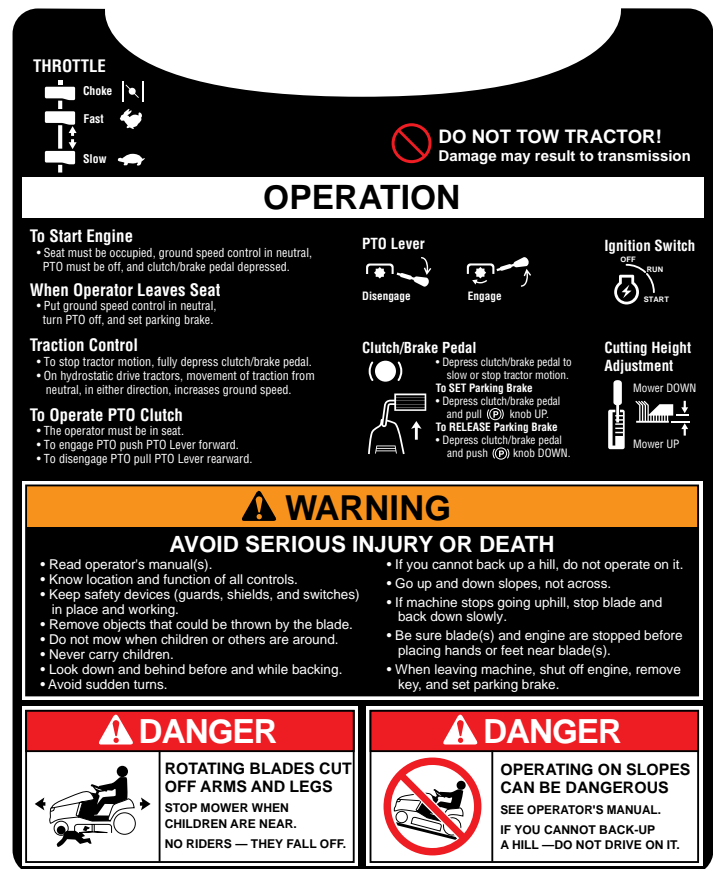
Decal - Danger
Part No. 1704276



Decal - Danger
Part No. 1704277



Decal - Hydro Release Valve
Part No. 1719635



Decal - Operating Instructions
Part No. 1719519

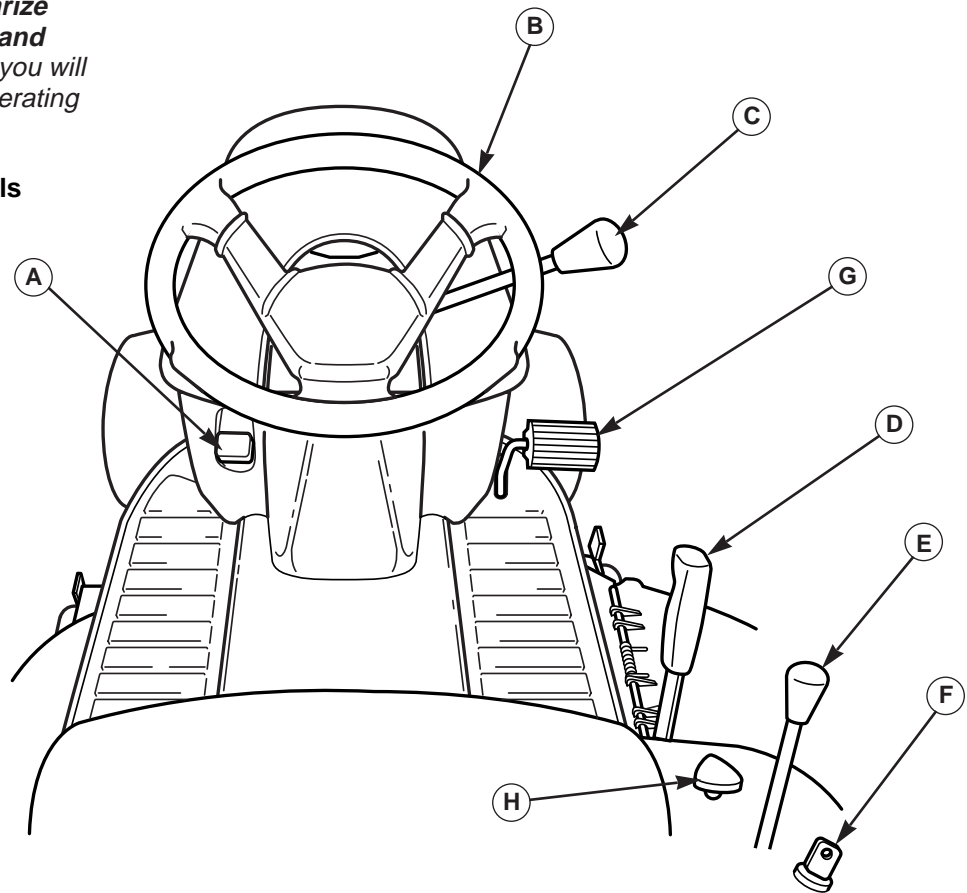
Features & Controls



Please take a moment and familiarize yourself with the name, location, and function of these controls so that you will better understand the safety and operating instructions provided in this manual.

Figure 1. Tractor & Mower Controls

- A. Throttle / Choke
- B. Steering Wheel
- C. PTO Control Lever
- D. Mower Cutting Height Lever
- E. Ground Speed Control Lever
- F. Ignition Switch
- G. Clutch / Brake Pedal
- H. Parking Brake Control Knob



CONTROL FUNCTIONS

The information below briefly describes the function of individual controls. Starting, stopping, driving, and mowing require the combined use of several controls applied in specific sequences. To learn what combination and sequence of controls to use for various tasks see the OPERATION section.

A. Throttle / Choke Control

The throttle controls engine speed. Move the throttle up to increase engine speed and down to decrease engine speed. Always operate at FULL throttle. Note: Moving the throttle control fully forward closes the choke. A warm engine may not require choking.

B. Steering Wheel

The steering wheel controls the direction of the tractor's travel by angling the front wheels.

C. PTO Lever

The PTO (Power Take-Off) lever engages and disengages attachments that use the PTO. To engage the PTO, move the lever forward. To disengage the PTO, move the lever all the way back. You will feel the lever lock into both the engaged and disengaged positions.

Note that the operator must be seated firmly in the tractor seat for the PTO to function. Also note that the tractor will not start unless the lever is in the disengaged position.

D. Mower Cutting Height Lever

The cutting height adjustment lever controls the mower cutting height. Set the mower deck in the highest cutting position when transporting to and from the mowing site.

E. Ground Speed Control Lever

The tractor's forward & reverse ground speed is controlled by the ground speed control lever.

GEAR MODELS — On models with Gear transmissions, ground speed is selected from one of 4 speeds.

To change gear positions, first fully depress the clutch/brake pedal, move the ground speed control lever to the appropriate gear position, then release the clutch/brake pedal to begin tractor movement.

Note: On Gear Models, shift gears only with tractor stopped and clutch/brake pedal fully depressed.

HYDRO MODELS — On models with Hydrostatic transmissions, ground speed is selected from a continuous range.

Moving the lever forward in the F range increases FORWARD tractor motion, and moving the lever back in the R range increases REVERSE tractor motion. **The further the lever is moved in either range, the faster the tractor will travel in that direction.** *Note: Depressing the clutch/brake pedal is NOT necessary when changing speeds.* Placing the lever in the N position puts the transmission in NEUTRAL, and ceases tractor motion. (Apply & set the Parking Brake before leaving the operator's position).

Always mow with the engine speed at full throttle.

Note: If the terrain is rough, hilly, or sloping, use a slower forward speed or gear. If the grass is wet or over three inches (76mm) high, use full engine speed with a low forward speed or gear 1 so the mower will have enough power to cut the grass.

F. Ignition Switch

The ignition switch starts and stops the engine, it has three positions:

- OFF Stops the engine and shuts off the electrical system.
- RUN Allows the engine to run and powers the electrical system.
- START Cranks the engine for starting.

NOTE: Never leave the ignition switch in the RUN position with the engine stopped—this drains the battery.

G. Clutch / Brake Pedal

Depressing the clutch / brake pedal disengages the drive clutch and applies the tractor brake.

H. Parking Brake Control Knob

Engages parking brake. Depress clutch/brake pedal (I) fully and pull up knob to engage parking brake. To disengage brake, depress pedal and push knob down.



SAFETY INTERLOCK SYSTEM TESTS

This unit is equipped with safety interlock switches and other safety devices. These safety systems are present for your safety: do not attempt to bypass safety switches, and never tamper with safety devices. Check their operation regularly.

Operational SAFETY Checks

Your unit is equipped with a seat switch safety system. Check the seat switch operation every fall and spring with the following tests.

Test 1 — Engine should NOT crank if:

- PTO lever is ENGAGED, OR
- Brake pedal is NOT fully depressed (parking brake OFF), OR
- Ground speed lever is out of NEUTRAL position.

Test 2 — Engine SHOULD crank if:

- PTO lever is DISENGAGED, AND
- Brake pedal is fully depressed (parking brake ON), AND
- Ground speed lever is in NEUTRAL position.

Test 3 — Engine should SHUT OFF if:

- Operator rises off seat with PTO engaged, OR
- Operator rises off seat with brake pedal NOT fully depressed (parking brake OFF).

Test 4 — Blade Brake Check

Mower blades and mower drive belt should come to a complete stop within five seconds after PTO is turned OFF (or operator rises off seat). If mower drive belt does not stop within five seconds, readjust the PTO clutch as described in the ADJUSTMENTS section or see your dealer.

NOTE: Once the engine has stopped, the PTO must be turned off after the operator returns to the seat in order to start the engine.

WARNING

If the unit does not pass a safety test, do not operate it. See your authorized dealer. Under no circumstance should you attempt to defeat the purpose of the safety interlock system.

Operating the Tractor



GENERAL OPERATING SAFETY

Before first time operation:

- Be sure to read all information in the Safety and Operation sections before attempting to operate this tractor and mower.
- Become familiar with all of the controls and how to stop the unit.
- Drive in an open area without mowing to become accustomed to the unit.



CHECKS BEFORE STARTING

- Check that the crankcase is filled with oil to full mark on dipstick. See the engine Operator's Manual for instructions and oil recommendations.
- Make sure all nuts, bolts, screws and pins are in place and tight.
- Adjust the seat position, and make certain you can reach all controls from operator's position.
- Fill the gasoline tank with fresh gasoline. Refer to engine manual for gasoline recommendations.
- Make certain rear counterweights are installed if you will be operating the unit on sloping ground.

⚠ WARNING

Never allow passengers to ride on the unit.

Before leaving the operator's position for any reason, engage the parking brake, disengage the PTO, stop the engine and remove the key.

To reduce fire hazard, keep the engine, tractor and mower free of grass, leaves and excess grease. Do not stop or park tractor over dry leaves, grass or combustible materials.

Gasoline is highly flammable and must be handled with care. Never fill the tank when the engine is still hot from recent operation. Do not allow open flame, smoking or matches in the area. Avoid over-filling and wipe up any spills.

⚠ DANGER

OPERATING ON SLOPES CAN BE DANGEROUS

Never operate on slopes greater than 30 percent (16.7°) which is a rise of three feet vertically in 10 feet horizontally.

Operate the unit at a slow ground speed when driving onto slope.

When operating on slopes that are greater than 15 percent (8.5°) but less than 30 percent, use additional wheel weights or counterweights.

In addition to counterweights, use extra caution when operating on slopes with rear-mounted grass catcher. Mow UP and DOWN the slope, never across the face, use caution when changing directions and DO NOT START OR STOP ON SLOPE.

CLUTCH/BRAKE PEDAL OPERATION

HYDRO MODELS

1. Depressing the clutch/brake pedal (A, Figure 2) disengages the transmission drive. Fully depressing the pedal applies the rider brake.
2. Parking brake is applied by pulling up on the parking brake control knob (B, Figure 2) with the clutch/brake pedal fully depressed.

GEAR MODELS

1. Depressing the clutch/brake pedal (A, Figure 2) disengages the transmission drive belt and allows the gear lever to be shifted. Fully depressing the clutch/brake pedal from applies the tractor brake.
2. Parking brake is applied by pulling up on the parking brake control knob (B, Figure 2) with the clutch/brake pedal fully depressed.

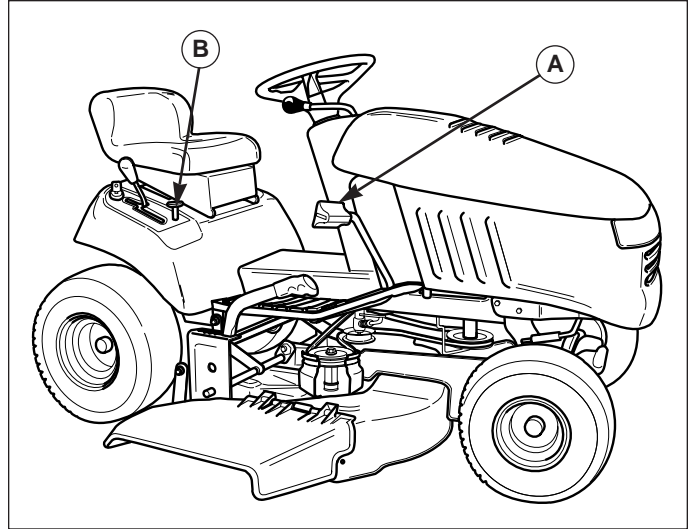


Figure 2. Clutch/Brake Pedal Operation

- A. Clutch/Brake Pedal
B. Parking Brake Control Knob

STARTING THE ENGINE

1. While sitting in the operator's seat, fully depress the brake pedal or set the parking brake.
2. Make sure that the ground speed control lever is in NEUTRAL.
3. Disengage the PTO clutch.
4. Set throttle to CHOKE.

NOTE: A warm engine may not require choking.

5. Insert the ignition key and turn it to START.
6. After the engine starts, move the engine throttle control to SLOW. Warm up the engine by running it for at least a minute before engaging the PTO or driving the tractor.

NOTE: In the event of an emergency the engine can be stopped by simply turning the ignition switch to STOP. Use this method only in emergency situations. For normal engine shut down follow the procedure given in STOPPING THE TRACTOR.

WARNING

If you do not understand how a specific control functions, or have not yet thoroughly read the FEATURES & CONTROLS section, do so now.

Do NOT attempt to operate the tractor without first becoming familiar with the location and function of ALL controls.

STOPPING THE TRACTOR & ENGINE

1. Returning the ground speed lever to NEUTRAL (hydro models) or depressing the clutch/brake pedal (gear models) will stop tractor movement. **For emergency stopping of any model, FULLY depress the clutch/brake pedal to apply the tractor brake.**
2. Engage the parking brake.
3. Disengage the PTO.
4. Position the throttle control at FULL.
5. Turn the ignition switch to OFF and remove the key.

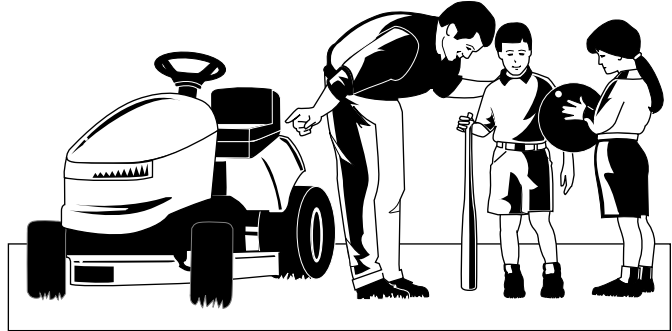
NOTE: Stopping the engine at speeds lower than full throttle can cause engine damage. Do not stop the engine with the throttle control in the IDLE position.

Operating the Tractor

WARNING

Tragic accidents can occur if the operator is not alert to the presence of children. Children are often attracted to the unit and the mowing activity. Never assume that children will remain where you last saw them.

- Keep children out of the mowing area and under the watchful care of another responsible adult.
- Be alert and turn unit off if children enter the area.
- Before and during reverse operation, look behind and down for small children.
- Never carry children. They may fall off and be seriously injured or interfere with safe unit operation.
- Never allow children to operate the unit.
- Use extra care when approaching blind corners, shrubs, trees, or other objects that may obscure vision.



DRIVING THE TRACTOR

1. Sit in the seat and adjust the seat so that you can comfortably reach all the controls (see Seat Adjustment, Adjustments Section).
2. Engage the parking brake.
3. Make sure the PTO lever is disengaged.
4. Start the engine (see STARTING THE ENGINE).

GEAR MODELS:

5. Depress the clutch / brake pedal.
6. Move the ground speed lever to the desired speed. Typically, gears 1-3 are used when mowing, and gears 4 and 5 are used when transporting to and from the work site. The taller (or thicker) the grass, the slower the desired ground speed.
7. *Slowly* release the clutch / brake pedal to drive.
To change gears, fully depress the clutch / brake pedal, shift to the desired gear, then slowly release the clutch / brake pedal. **DO NOT** shift while moving or the transmission will be damaged.

HYDRO MODELS:

5. Be sure the ground speed lever is in the NEUTRAL position.
6. Release the parking brake by depressing the clutch / brake pedal and pushing the parking brake knob down. Release the clutch brake pedal.
7. Move the ground speed lever forward until the desired ground speed is achieved. There is no need to clutch when changing speeds or direction.

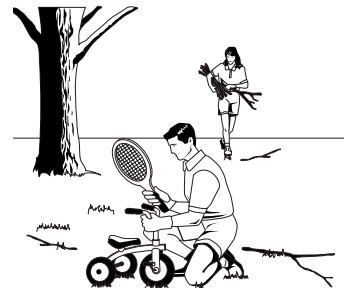
MOWING

1. Engage the parking brake. Make sure the PTO lever is disengaged.
2. Start the engine (see STARTING THE ENGINE).
3. Set the mower cutting height to the desired level.
4. Set the throttle to FULL.
5. Engage the PTO.
6. Begin mowing. See the LAWN CARE & MOWING INFORMATION section at the back of this manual for tips on mowing patterns, lawn care, and troubleshooting information.
7. When finished, shut off the PTO.
8. Stop the engine (see STOPPING THE TRACTOR AND ENGINE).

WARNING

Make certain the area of operation, and especially the direction of travel is clear of objects, people and animals.

Always look DOWN AND BEHIND before backing!



PUSHING THE TRACTOR BY HAND

HYDRO MODELS

1. Disengage the PTO and turn the engine off.
2. Move the transmission release lever up, pull back approximately 1", and press down to lock into released position (Figure 6).
3. The tractor can now be pushed by hand.

NOTE: To drive the tractor, the release lever must be moved completely forward and pushed down into locked position.

GEAR MODELS

1. Disengage the PTO and turn the engine off.
2. Place the ground speed lever in the NEUTRAL.
3. Disengage the parking brake.
4. The tractor can now be pushed by hand.



DO NOT TOW TRACTOR

Towing the unit will cause transmission damage. • Do not use another vehicle to push or pull this unit. • Do not actuate the transmission release valve lever while the engine is running.

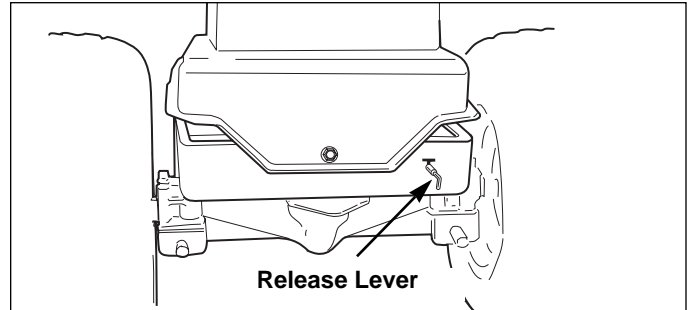


Figure 3. Release Lever - Hydro Models

Operating the Tractor

MOWER DECK REMOVAL & INSTALLATION

WARNING

Engage parking brake, disengage PTO, stop engine, disconnect spark plug wire(s), and remove key before attempting to install or remove the mower.

CAUTION

The muffler and surrounding areas may be hot.

Removing the Mower Deck

NOTE: Perform mower removal on a hard, level surface such as a concrete floor.

1. Park the tractor, disengage the PTO lever, turn off the engine, remove the key, disconnect the spark plug wire(s), and engage the parking brake.
2. Place mower in the lowest cutting position using the mower height adjustment lever (A, Figure 4).
3. Remove the mower belt from the engine pulley (D, Figure 4) by flexing the engine belt guide rearward slightly, and pulling the belt off the pulley.
4. Remove the hair pin clip from the clutch rod (C, Figure 4).
5. Remove the clutch rod (C, Figure 4) from the bottom of the PTO lever (B). Reinstall the hair pin clip removed in the previous step.
6. Remove the hair pin clip from the long hitch rod (A, Figure 5).
7. Remove the hitch rod (A, Figure 5) from the mower.
8. Turn wheels straight ahead. Pull back on spring-loaded lever (B, Figure 6) and lift mower hitch off of the tractor bracket (A).
9. Turn wheels fully left, and slide mower deck out from under the right side of the tractor. Reinstall the hitch rod and hair pin clip (A, Figure 5) in the mower.

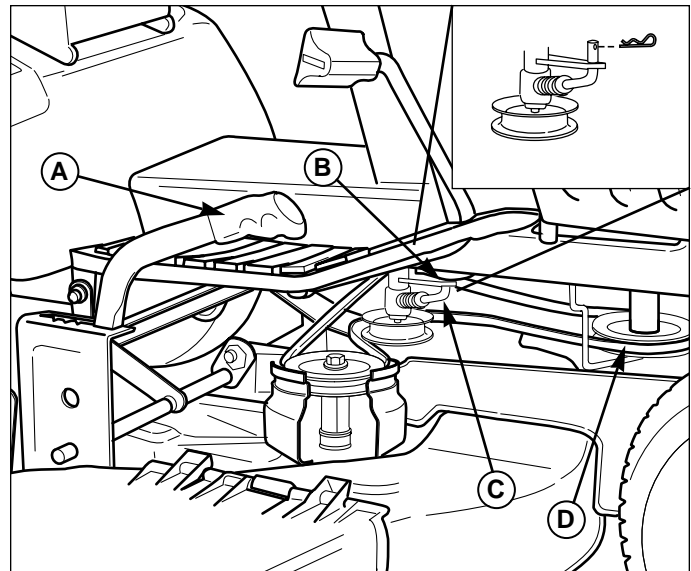


Figure 4. Mower Deck - Right Side

- | | |
|------------------------|------------------|
| A. Height Adj. Lever | C. Clutch Rod |
| B. Bottom of PTO Lever | D. Engine Pulley |

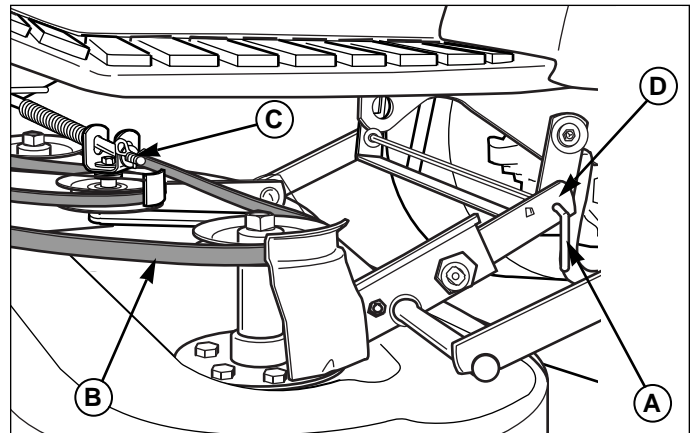


Figure 5. Mower Deck - Left Side (38" Deck Shown)

- | |
|-----------------------------------|
| A. Long Hitch Rod & Hair Pin Clip |
| B. Mower Drive Belt |
| C. Clutch Rod |
| D. Rear Hitch Brackets |

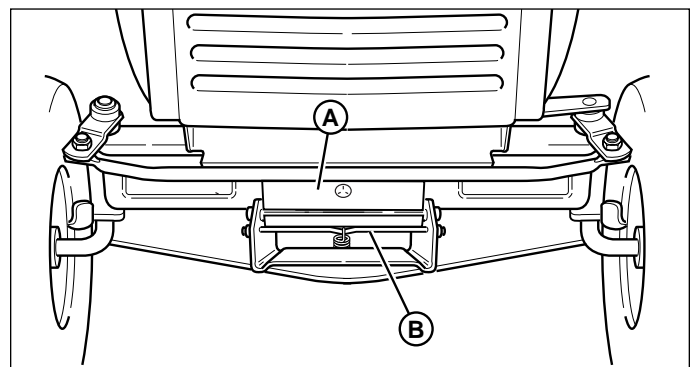


Figure 6. Mower Hitch

- | |
|---------------------------|
| A. Tractor Hitch Brackets |
| B. Spring-Loaded Lever |

Installing the Mower Deck

NOTE: Perform mower installation on a hard, level surface such as a concrete floor.

1. Park the tractor, disengage the PTO lever, turn off the engine, remove the key, disconnect the spark plug wire(s), and engage the parking brake.
2. Place mower in the lowest cutting position using the mower height adjustment lever (C, Figure 7).
3. Turn the wheels left, and slide the mower deck under the tractor.
4. Turn the wheels straight ahead and align the rear mounting brackets (D, Figure 5).
5. Pull the spring-loaded lever (B, Figure 6) forward, hook the mower hitch on the tractor bracket (A). Release the spring loaded lever to lock the mower hitch in the tractor bracket.
6. Install the long hitch pin (A, Figure 5) through the rear mounting brackets. Secure with a hair pin clip.

NOTE: If the rear mounting bracket holes are not aligned, shift the mower deck and turn the front wheels slightly.

7. Install the mower drive belt (B, Figure 7) on the engine pulley (A); flex the engine belt guide rearward slightly to get the belt onto the pulley.
8. Connect the clutch rod (C, Figure 4) to the bottom of the PTO lever (B). Secure using a hair pin clip.

MOWER CUTTING HEIGHT ADJUSTMENT

1. Pull the cutting height lever (C, Figure 7) back and to the left to release it.
2. Set the mower cutting height to the desired level.
3. Move the lever to the right to lock it.

WARNING

Engage parking brake, disengage PTO, stop engine, disconnect spark plug wire(s), and remove key before attempting to install or remove the mower.

CAUTION

The muffler and surrounding areas may be hot.

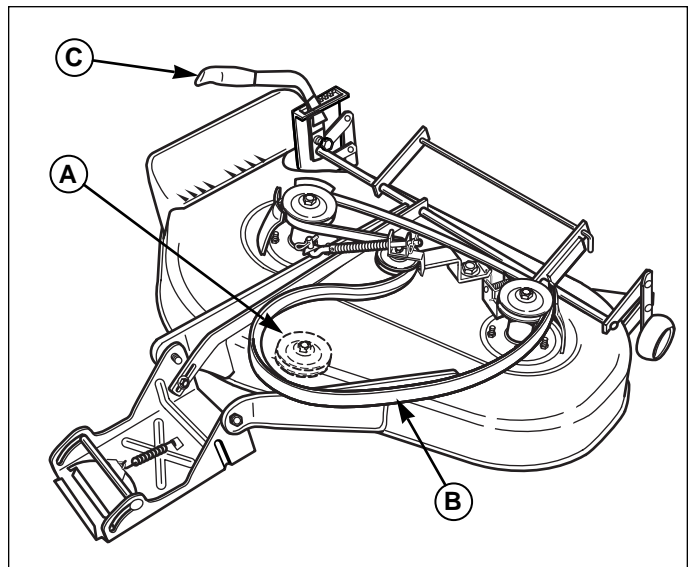


Figure 7. Mower Belt Routing

- A. Engine Pulley
- B. Mower Drive Belt
- C. Mower Height Adjustment Lever

STORAGE

Temporary Storage (30 Days Or Less)

Remember, the fuel tank will still contain some gasoline, so never store the unit indoors or in any other area where fuel vapor could travel to any ignition source. Fuel vapor is also toxic if inhaled, so never store the unit in any structure used for human or animal habitation.

Here is a checklist of things to do when storing your unit temporarily or in between uses:

- Keep the unit in an area where children will not come into contact with it. If there's any chance of unauthorized use, remove the keys and disconnect the spark plug wires.
- If the unit can't be stored on a reasonably level surface, chock the wheels.
- Clean all grass and dirt from the mower.

NOTE: If storing your tractor between winter snow removal jobs in a cold area, we suggest that you fill the fuel tank at the completion of each job to prevent water condensation in the fuel tank. Wait for engine to cool before filling tank.

Long Term Storage (Longer Than 30 Days)

Before you store your unit for the off-season, read the Maintenance and Storage instructions in the Safety Rules section, then perform the following steps:

1. Drain crankcase oil and refill with a grade of oil that will be required when unit is used again.
2. Prepare the mower deck for storage as follows:
 - a. Remove mower deck from the unit.
 - b. Clean underside of mower deck.
 - c. Coat all bare metal surfaces with paint or light coat of oil to prevent rusting.
3. Clean external surfaces and engine.
4. Prepare engine for storage. See engine owner's manual.
5. Clean any dirt or grass from cylinder head cooling fins, engine housing and air cleaner element.
6. Cover air cleaner and exhaust outlet tightly with plastic or other waterproof material to keep out moisture, dirt and insects.
7. Completely grease and oil unit as outlined in the Normal Care section.
8. Clean up unit and apply paint or rust preventative to any areas where paint is chipped or damaged.
9. Be sure the battery is filled to the proper level with water and is fully charged. Battery life will be increased if it is removed, put in a cool, dry place and fully charged about once a month. If battery is left in unit, disconnect the negative cable.

WARNING

Never store the unit, with gasoline in engine or fuel tank, in a heated shelter or in enclosed, poorly ventilated enclosures. Gasoline fumes may reach an open flame, spark or pilot light (such as a furnace, water heater, clothes dryer, etc.) and cause an explosion.

Handle gasoline carefully. It is highly flammable and careless use could result in serious fire damage to your person or property.

Drain fuel into an approved container outdoors away from open flame or sparks.

10. Drain fuel system completely or add a gasoline stabilizer to the fuel system. If you have chosen to use a fuel stabilizer and have not drained the fuel system, follow all safety instructions and storage precautions in this manual to prevent the possibility of fire from the ignition of gasoline fumes. Remember, gasoline fumes can travel to distant sources of ignition and ignite, causing risk of explosion and fire.

NOTE: Gasoline, if permitted to stand unused for extended periods (30 days or more), may develop gummy deposits which can adversely affect the engine carburetor and cause engine malfunction. To avoid this condition, add a gasoline stabilizer to the fuel tank and run the engine a few minutes, or drain all fuel from the unit before placing it in storage.

STARTING AFTER LONG TERM STORAGE

Before starting the unit after it has been stored for a long period of time, perform the following steps.

1. Remove any blocks from under the unit.
2. Install the battery if it was removed.
3. Unplug the exhaust outlet and air cleaner.
4. Fill the fuel tank with fresh gasoline. See engine manual for recommendations.
5. See engine owner's manual and follow all instructions for preparing engine after storage.
6. Check crankcase oil level and add proper oil if necessary. If any condensation has developed during storage, drain crankcase oil and refill.
7. Inflate tires to proper pressure. Check fluid levels.
8. Start the engine and let it run slowly. DO NOT run at high speed immediately after starting. Be sure to run engine only outdoors or in well ventilated area.



Regular Maintenance

MAINTENANCE SCHEDULE & PROCEDURES

The following schedule should be followed for normal care of your tractor and mower.

SAFETY ITEMS	Before Each Use	Every 5 Hours	Every 25 Hours	Every 100 Hours	Every 250 Hours	Spring & Fall
Check Safety Interlock System						●
Check Tractor Brakes						●
Check Mower Blade Stopping Time				●		
NORMAL CARE ITEMS	Before Each Use	Every 5 Hours	Every 25 Hours	Every 100 Hours	Every 250 Hours	Spring & Fall
Check Tractor/Mower for loose hardware		●				
Check Engine Oil Level	* ●	*** ●				
Check / Change Engine Air Filter	* *** ,					
Change Engine Oil & Filter	* ** ,					
Inspect Spark Plug(s)	*					
Check / Replace Fuel Filter				●		
Clean / Replace Exhaust Screen			‡			
Check Transmission Oil Level					●	
Lubricate Tractor & Mower			*** ●			
Lubricate Rear Axle Shafts						Yearly
Check Battery Fluid				●		
Clean Battery & Cables				●		
Check Tire Pressure			●			
Clean & Sharpen Mower Blades				●		

‡ Clean or replace spark arrester every 50 hours.

* See the engine manufacturer's owner's manual.

** Change original engine oil after initial break-in period. Refer to engine owner's manual.

*** More often in hot (over 85° F: 30° C) weather or dusty operating conditions.

Always refer to the engine manufacturer's owner's manual for specific engine information.

Regular Maintenance

RAISING THE HOOD & SEAT

To raise the hood, grasp the hood recess (Figure 8) on top, then pivot the hood up and forward.

To raise the seat for battery access, tilt the seat forward.



NOTICE

Do not run the tractor with the hood raised. Engine heat will damage the headlight bezel and hood.



WARNING

Gasoline is highly flammable and must be handled with care. Never fill the tank when the engine is still hot from recent operation. Do not allow open flame, smoking or matches in the area. Avoid over-filling and wipe up any spills.

Do not remove fuel filter when engine is hot, as spilled gasoline may ignite. DO NOT spread hose clamps further than necessary. Ensure clamps grip hoses firmly over filter after installation.



Do not use gasoline containing METHANOL, gasohol containing more than 10% ETHANOL, gasoline additives, or white gas because engine/fuel system damage could result.

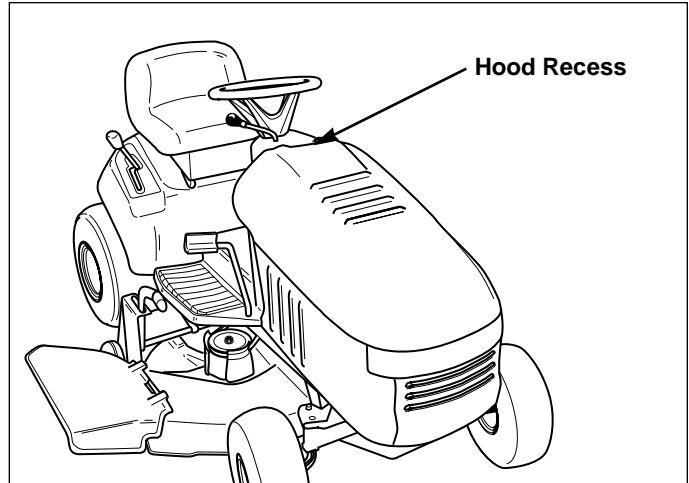


Figure 8. Gas Tank Located Under Hood

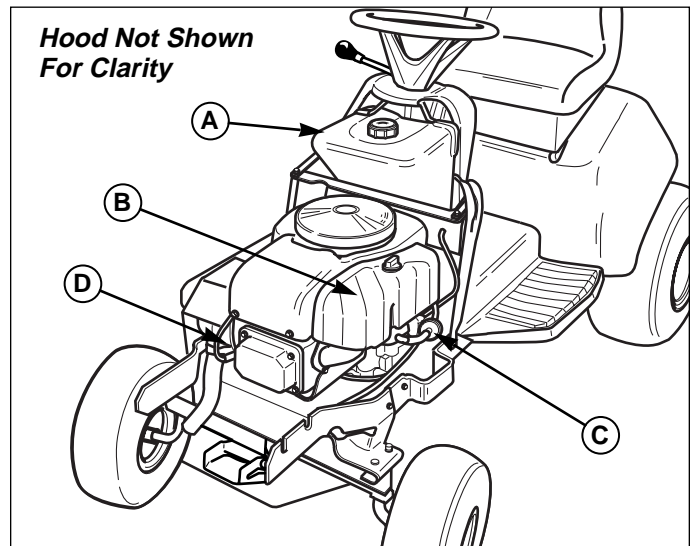


Figure 9. Engine Compartment

- A. Gas Tank
- B. Air Filter
- C. Fuel Filter
- D. Spark Plug

CHECKING / ADDING FUEL

To add fuel:

1. Remove the cap from the fuel tank (A, Figure 9).
2. Fill the tank. Do not overfill. Leave room in the tank for fuel expansion. Refer to your engine manual for specific fuel recommendations.
3. Install and hand tighten the fuel cap.

CHECK TIRE PRESSURES

Service Interval: Every 25 Hours

Tire Pressure should be checked periodically, and maintained at the levels shown in the chart. Note that these pressures may differ slightly from the “Max Inflation” stamped on the side-wall of the tires. The pressures shown provide proper traction, improve cut quality, and extend tire life.

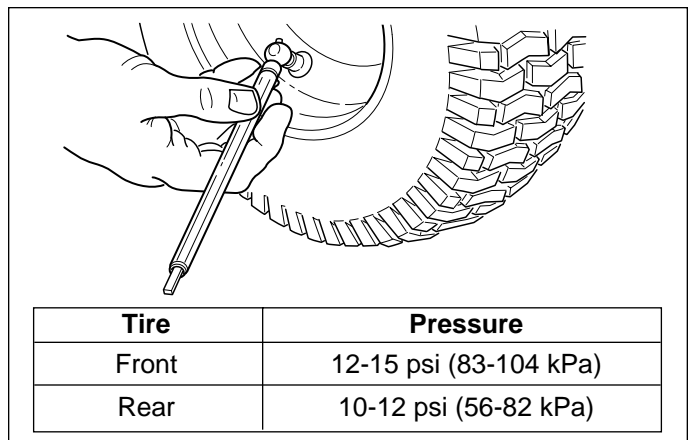


Figure 10. Checking Tire Pressure

CHECK / REPLACE FUEL FILTER

Service Interval: Every 100 Hours

The fuel filter (C, Figure 9) is located in the fuel line between the fuel tank and the carburetor (left side of engine).

If filter is dirty or clogged, replace as follows:

1. Disengage the PTO, engage the parking brake, turn the ignition switch OFF, and remove the key. Allow the engine to cool. Disconnect the negative battery cable.
2. Place a container below the filter to catch spilled fuel.
3. Using a pliers, open and slide hose clamps from fuel filter (C, Figure 9).
4. Remove hoses from filter.
5. Install new filter in proper flow direction in fuel line.
6. Secure with hose clamps.
7. Reconnect the negative battery cable when finished.

ENGINE MAINTENANCE

The following engine maintenance procedures and service intervals can be found in your Engine Owner's Manual. Refer to Figure 11 for engine maintenance item locations.

- Engine Oil & Filter Check / Change
- Check / Change Air Filter
- Inspect & Replace Spark Plugs

BLADE BRAKE CHECK

Service Interval: Every 100 Hours or Fall & Spring

Mower blades and mower drive belt should come to a complete stop within five seconds after PTO is disengaged.

1. With tractor in neutral, PTO disengaged and operator in seat, start the engine.
2. Engage the PTO and wait several seconds. Disengage the PTO and check the amount of time it takes for the mower drive belt to stop.
3. If mower drive belt does not stop within five seconds, see your dealer.

SAFETY INTERLOCK SYSTEM CHECK

Service Interval: Every Fall & Spring

Check the function of the safety interlock system using the test procedure found on page 9 of this manual. If the tractor fails any of the tests, see your dealer.

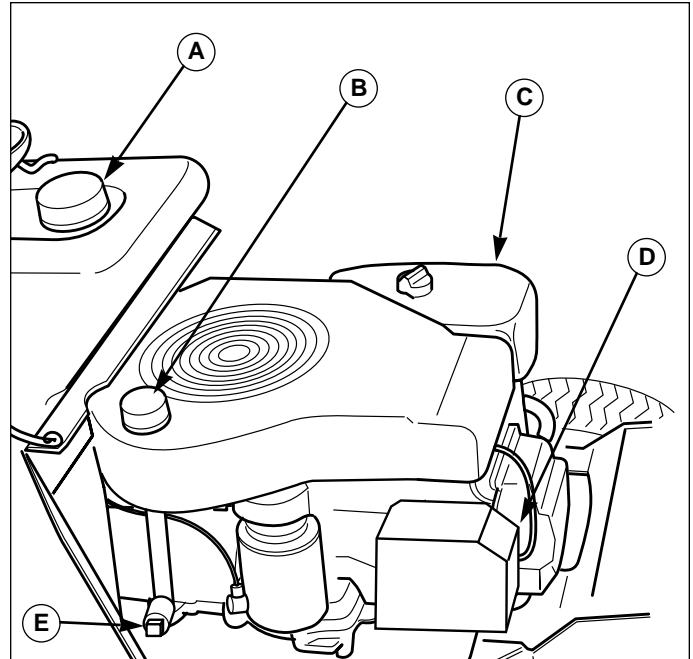


Figure 11. Engine Compartment

- | | |
|-------------------------|---------------|
| A. Gas Tank | D. Spark Plug |
| B. Oil Fill / Dip Stick | E. Oil Drain |
| C. Air Filter | |

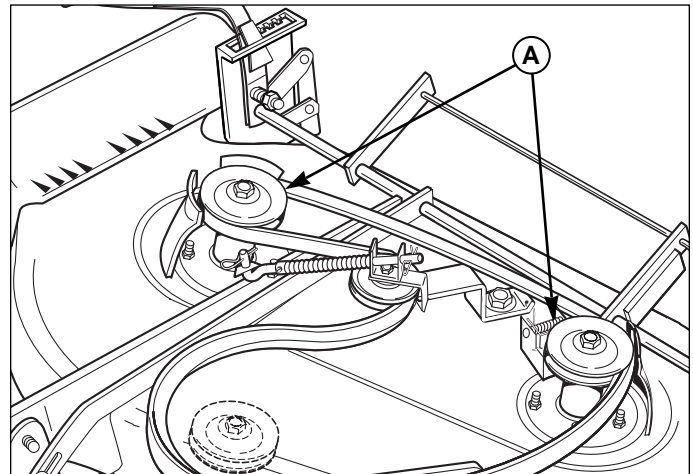


Figure 12. Mower Deck Clutch & Brake System

- A. Non-Adjustable Pulley Brakes

Regular Maintenance

GEAR TRANSMISSION SERVICE

The Peerless MST-205-515A gear drive transmission does not require regular maintenance. See your Authorized Dealer for transmission service.

HYDRO TRANSMISSION SERVICE



Do not allow dirt, water, or other debris to enter the expansion chamber or transmission. Even a small amount of dirt can damage the transmission.

Transmission Service Information

Service Interval: Check Oil Level Every 250 Hrs

Transmission Oil Capacity: Approx. 2-1/2 Quarts

Transmission Oil Type: SAE 10W-30 with a minimum API rating of SG/CD.

The Tuff Torq K-51 hydrostatic drive transmission does not require regular maintenance other than checking the oil level every 250 hours. See your Authorized Dealer for transmission service.

ATTENTION: It is critical that dirt and water be kept out of the transmission. Thoroughly clean and dry all the surrounding surfaces before opening the transmission.

1. Tilt the seat forward to access the battery compartment (Figure 13)
2. Remove the battery and clean the battery compartment. (See Battery Maintenance).
3. Clean off the fill plug (see Figure 14) and surrounding area.
4. Using a screwdriver, pry the fill plug out of the transmission and remove the spring.
5. Check the oil level. The transmission should be filled with oil up to the top notch (see Figure 14 inset). If not, add oil.
6. Replace the fill plug. Reinstall the battery. (See Battery Maintenance).

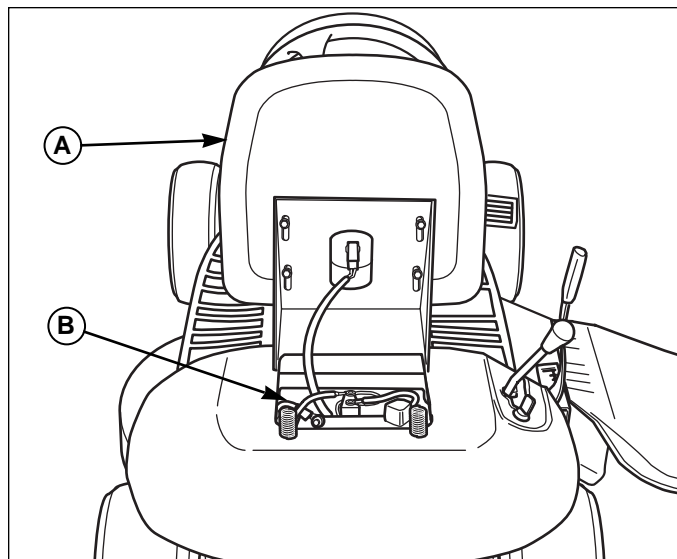


Figure 13. Seat Adjustment

- A. Seat
- B. Battery Compartment

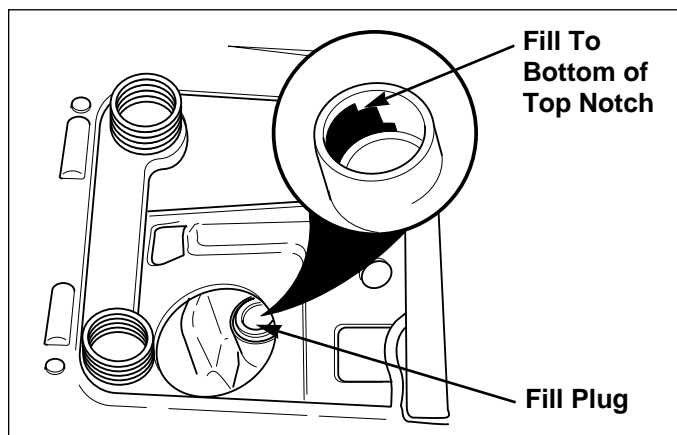


Figure 14. Hydro Transmission Fill Plug Location

EXHAUST SCREEN SERVICE

⚠ WARNING

Always allow the engine to cool before beginning any service work where the muffler or exhaust components must be handled. Wear gloves when handling exhaust components.

Service Interval: Every 50 Hours

Inspect, clean or replace the exhaust screen after every 50 hours of operation.

1. Park the tractor on a level surface. Disengage the PTO, turn off the engine and set the parking brake. Remove the key. **Allow the engine and muffler to cool.**
2. Remove the screw (B, Figure 15). Using a pair of pliers, remove the exhaust screen (A).
4. Inspect the screen. Shake any particles from the screen. If necessary, clean the screen with a wire brush and safety solvent. Reinstall the screen or if it is excessively dirty or damaged, replace it.

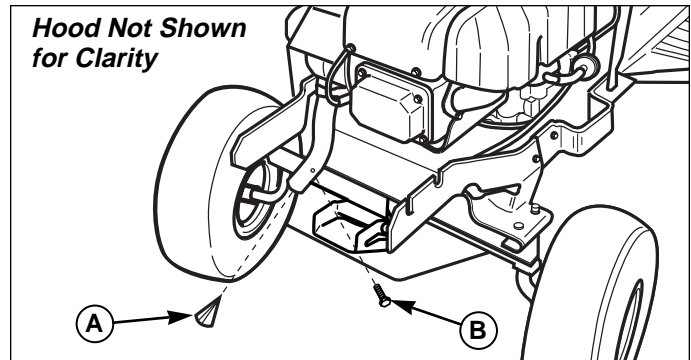


Figure 15. Clean / Replace Exhaust Screen

- A. Exhaust Screen
- B. Screw

BATTERY MAINTENANCE

⚠ WARNING

Be careful when handling the battery. Avoid spilling electrolyte. Keep flames and sparks away from the battery.

When removing or installing battery cables, disconnect the negative cable **FIRST** and reconnect it **LAST**. If not done in this order, the positive terminal can be shorted to the frame by a tool.

Checking the Battery Fluid

Service Interval: Every 100 Hours

1. Raise the seat to access battery compartment.
2. Remove the battery filler cap(s). Fluid must be even with the split ring full mark (C, Figure 16). If not, add distilled water.
3. Reinstall the filler cap(s).

Cleaning the Battery and Cables

Service Interval: Every 100 Hours

1. Disconnect the cables from the battery, negative cable first (A, Figure 16).
2. Remove the battery from the battery compartment.
3. Clean the battery compartment with a solution of baking soda and water.
4. Clean the battery terminals and cable ends with a wire brush and battery terminal cleaner until shiny.
5. Reinstall the battery in the battery compartment.
6. Reattach the battery cables, positive cable first (B, Figure 16).
7. Coat the cable ends and battery terminals with petroleum jelly or non-conducting grease.

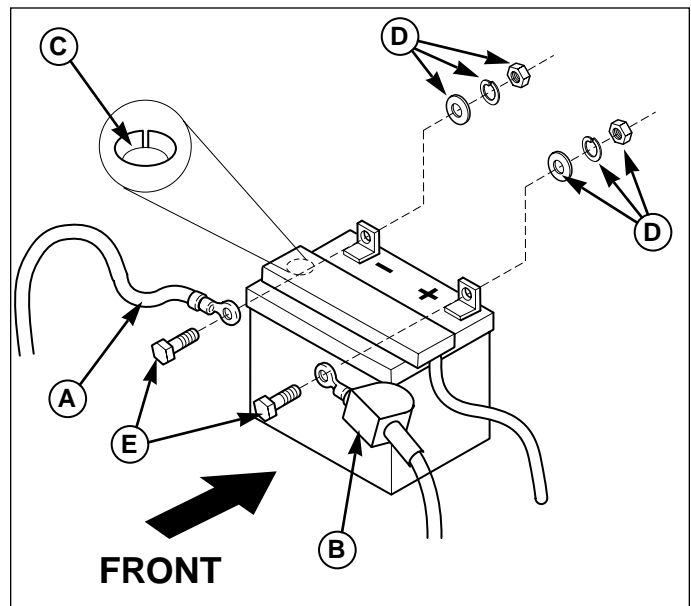


Figure 16. Battery Cables & Fill

- A. Negative Cable
- B. Positive Cable & Cover
- C. Split-Ring
- D. Nut, Lockwasher, & Washer
- E. Capscrew

Regular Maintenance

LUBRICATION

Service Interval: Every 25 Hours

Lubricate the unit at the locations shown in Figures 17 through 21 as well as the following lubrication points.

Grease:



- front axle pivot
- front wheel bearings
- steering linkage
- foot pedal
- mower pivots
- mower arbors
- transmission idler assembly pivot
- rear axle shafts (remove wheels)

Use grease fittings when present. Disassemble parts to apply grease to moving parts when grease fittings are not present.

Not all greases are compatible. Simplicity Lithium Grease is recommended; however, automotive-type lithium grease may be used when this is not available.

Oil:



- hydro linkage
- brake linkage
- frame pivot points
- mower deck height adjustment linkage

Generally, all moving metal parts should be oiled where contact is made with other parts. Keep oil and grease off belts and pulleys. Remember to wipe fittings and surfaces clean both before and after lubrication.

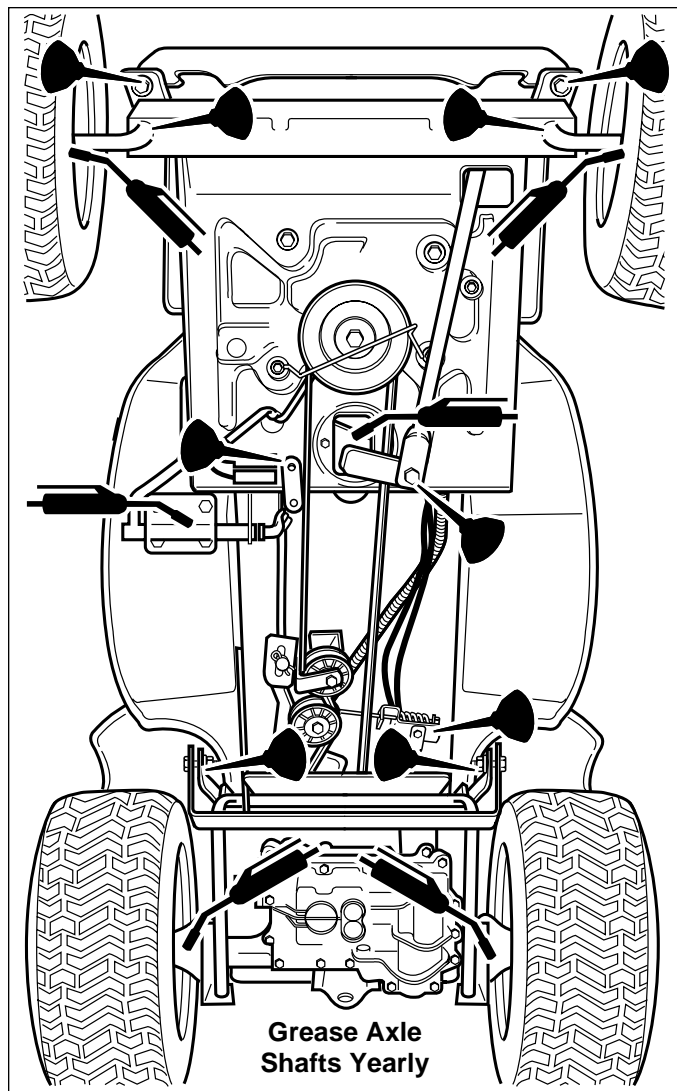


Figure 18. Lubricating Tractor - Typical

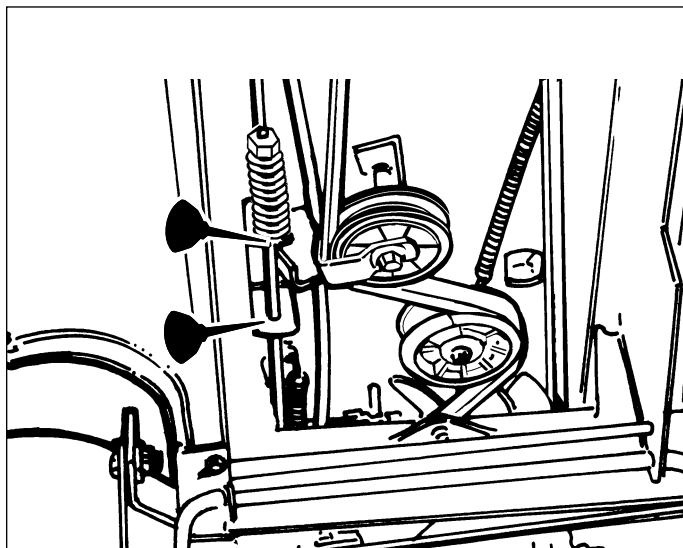


Figure 17. Brake Linkage Lubrication - Gear Models

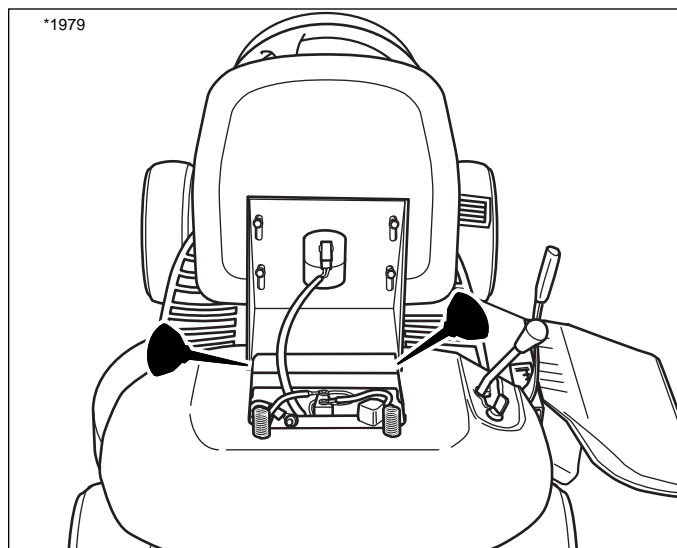


Figure 19. Shift Linkage Lubrication (Gear Model)

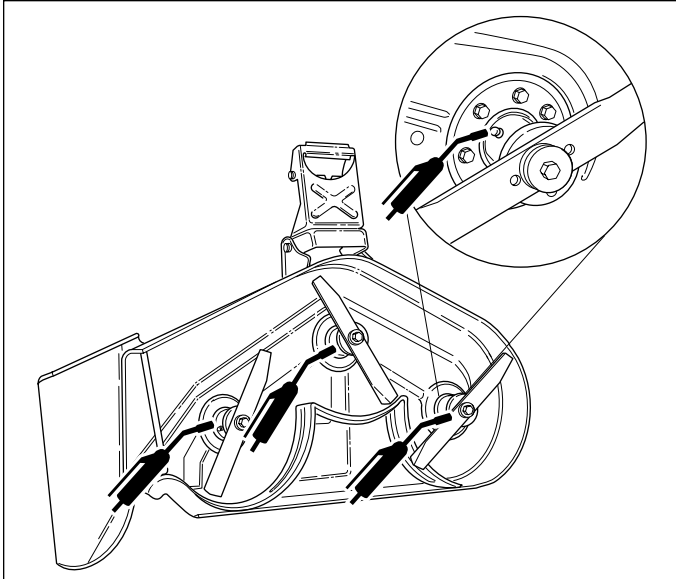


Figure 20. Arbor Lubrication Points

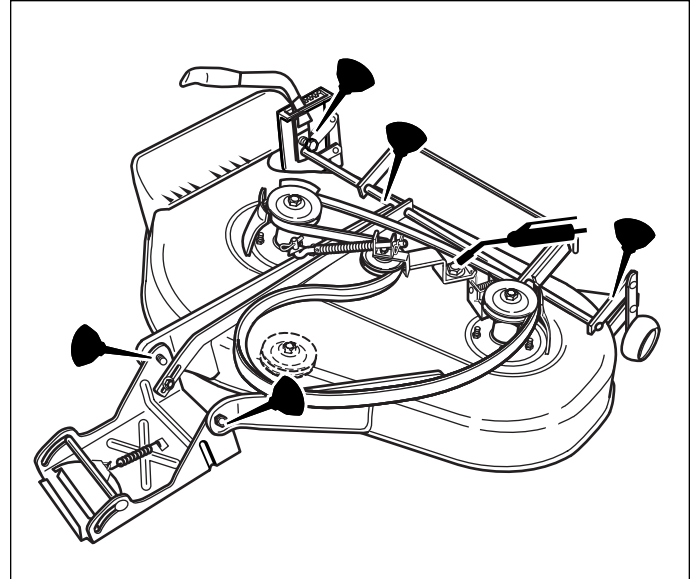


Figure 21. Lubricate Deck Linkage (38" shown)

Lubricate Rear Axle Shafts

Service Interval: Yearly

We recommend removing the rear wheels and lubricating the axle shafts yearly. This prevents the wheel from seizing onto the axle shaft and makes future service easier.

1. Remove the key and disconnect the spark plug wire while working on the unit.
2. Engage the parking brake and block the front wheels.
3. Using a jack or chain hoist positioned at the center of the rear frame, carefully jack the unit up until the rear tires are approximately 1" - 2" off the ground.

NOTE: For overall unit stability during service, do not jack rear end higher than required for wheel removal.

4. Support the rear of the unit on jackstands positioned under the rear frame.
5. Remove the plastic hub cap (H, Figure 22).
6. Remove e-ring (G) using a screwdriver.
7. Remove the hub cap retainer (F), small washer (E), and wheel assembly (D).
8. Lubricate the axle shaft with anti-seize compound or lithium grease.
9. Reinstall components in reverse order of disassembly and lower the unit.

NOTE: Gear drive models also have grease fittings located in the transmission casing beneath the axle bearings. Lubricate the grease fittings once a year.

⚠ WARNING

Always use a properly working lifting device with a capacity suitable for the weight of the unit being serviced.

Always use a jack stand to support the unit while performing service, and chock remaining wheels to prevent the unit from rolling off the supports.

Never work under or around an elevated unit that is not properly supported and secured in position with wheel chocks.

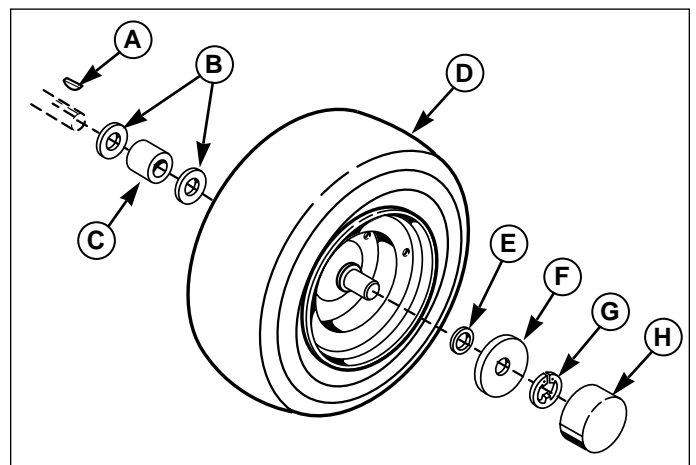


Figure 22. Lubricate the Rear Axle Shafts

- | | |
|--------------------|-------------------------------|
| A. Key | E. Small Washer (As Required) |
| B. Large Washers | F. Hub Cap Retainer |
| C. Spacer | G. E-Ring |
| D. Wheel Assembly. | H. Hub Cap |

SERVICING THE MOWER BLADES

⚠ WARNING

For your personal safety, do not handle the sharp mower blades with bare hands. Careless or improper handling of blades may result in serious injury.

Service Interval: Every 100 Hours or As Required

1. Remove mower from the tractor. See Mower Installation & Removal.
2. Blades should be sharp and free of nicks and dents. If not, sharpen blades as described in following steps.
3. To remove blade for sharpening, use a wood block to hold blade while removing the blade mounting cap-screw (Figure 23).
4. Use a file to sharpen blade to a fine edge. Remove all nicks and dents in the blade edge. If the blade is severely damaged, it should be replaced.
5. Balance the blade as shown in Figure 24. Center the blade's hole on a nail lubricated with a drop of oil. A balanced blade will remain level.
6. Reinstall each blade with the tabs pointing up toward deck as shown in Figure 25. Secure with a capscrew, spring washer and hex washer (be certain the hex washer is aligned with the hex shaft). Use a wooden block to prevent blade rotation and torque capscrews to 45-55 ft.lbs. (61-75 N.m.).

⚠ WARNING

For your personal safety, blade mounting capscrews must each be installed with a hex washer and spring washer, then securely tightened. Torque blade mounting capscrew to 45 - 55 ft. lbs. (61 - 75 N.m.)

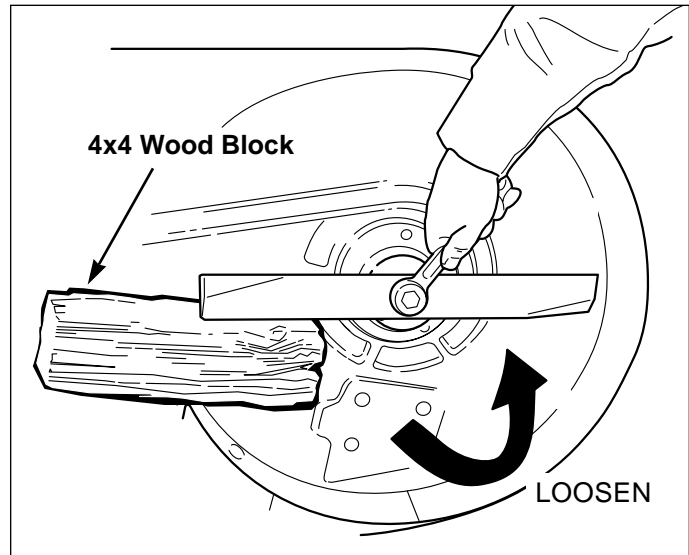


Figure 23. Removing the Blade

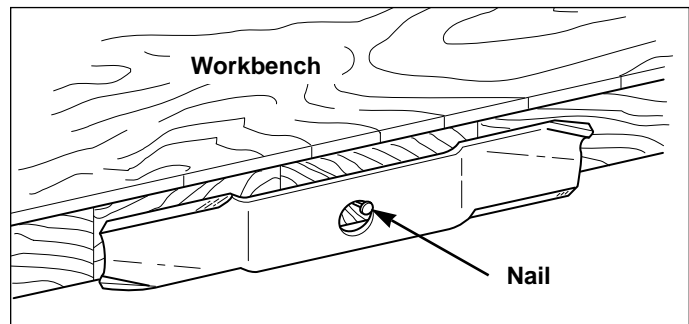


Figure 24. Balancing The Blade

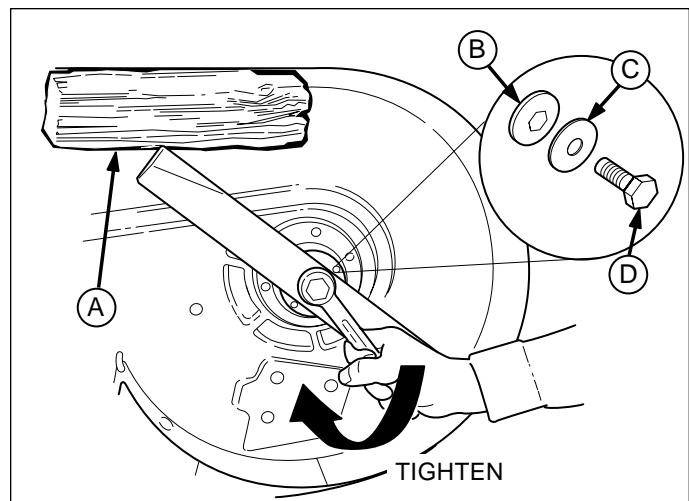


Figure 25. Installing The Blade

- | | |
|-------------------|------------------|
| A. 4x4 Wood Block | C. Spring Washer |
| B. Hex Washer | D. Blade Bolt |

MAINTENANCE RECORDS:

[illegible]

Troubleshooting, Adjustment, & Service



TROUBLESHOOTING

While normal care and regular maintenance will extend the life of your equipment, prolonged or constant use may eventually require that service be performed to allow it to continue operating properly.

The troubleshooting guide below lists the most common problems, their causes and remedies.

See the information on the following pages for instructions on how to perform most of these minor adjustments and service repairs yourself. If you prefer, all of these procedures can be performed for you by your local authorized dealer.

WARNING

To avoid serious injury, perform maintenance on the tractor or mower only when the engine is stopped and the parking brake engaged.

Always remove the ignition key, disconnect the spark plug wire and fasten it away from the plug before beginning the maintenance, to prevent accidental starting of the engine.

TROUBLESHOOTING THE TRACTOR

SYMPTOM	PROBLEM	SOLUTION
Engine will not turnover or start.	1. Ground speed lever not in neutral-start position.	1. Shift into neutral.
	2. PTO lever in ON position.	2. Place in OFF position.
	3. Out of fuel.	3. If engine is hot, allow it to cool, then refill the fuel tank.
	4. Engine flooded.	4. Move throttle control out of CHOKE position.
	5. Circuit breaker tripped.	5. Wait one minute for automatic reset, replace if defective.
	6. Battery terminals require cleaning.	6. See Maintenance Section.
	7. Battery discharged or dead.	7. Recharge or replace.
	8. Wiring loose or broken.	8. Visually check wiring & replace if damaged. Tighten loose connections.
	9. Solenoid or starter motor faulty.	9. Repair or replace. See authorized dealer.
	10. Safety interlock switch faulty.	10. See authorized service dealer.
	11. Spark plug(s) faulty, fouled.	11. See engine manual.
	12. Water in fuel.	12. Drain fuel & refill with fresh fuel.
	13. Gas is old or stale.	13. Drain fuel & replace with fresh fuel.
	14. Clutch/Brake pedal not depressed.	14. Depress pedal.
Engine starts hard or runs poorly.	1. Fuel mixture too rich.	1. Clean air filter. Check choke adjustment (engine speed control).
	2. Spark plug faulty, fouled, or incorrectly gapped.	2. See engine manual.
Engine knocks.	1. Low oil level.	1. Check/add oil as required.
	2. Using wrong grade oil.	2. See engine manual.
Excessive oil consumption.	1. Engine running too hot.	1. Clean engine fins, blower screen and air cleaner.
	2. Using wrong weight oil.	2. See engine manual.
	3. Too much oil in crankcase.	3. Drain excess oil.
Engine exhaust is black.	1. Dirty air filter.	1. Replace air filter. See maintenance section.
	2. Engine throttle control is in choke position.	2. Change engine speed control position.
Engine runs, but tractor will not drive.	1. Ground speed lever in neutral.	1. Shift in forward or reverse.
	2. Transmission release lever in "push" position (hydro only).	2. Move into drive position.
	3. Belt is broken.	3. See Drive Belt Replacement.
	4. Drive belt slips.	4. See problem and cause below.
	5. Brake is not fully released.	5. See authorized service dealer

Troubleshooting the Tractor — Continued

SYMPTOM	PROBLEM	SOLUTION
Tractor drive belt slips.	<ol style="list-style-type: none"> 1. Clutch is out of adjustment. 2. Pulleys or belt greasy or oily. 3. Belt stretched or worn. 4. Idler pulley pivot bracket "frozen" in de-clutched position. 	<ol style="list-style-type: none"> 1. See authorized service dealer. 2. Clean as required. 3. Replace belt. 4. Remove idler pulley bracket, clean and lubricate.
Brake will not hold.	<ol style="list-style-type: none"> 1. Brake is incorrectly adjusted. 2. Internal brake disc on transaxle worn. 	<ol style="list-style-type: none"> 1. See Brake Adjustment. 2. See authorized service dealer
Tractor steers hard or handles poorly.	<ol style="list-style-type: none"> 1. Steering linkage is loose. 2. Improper tire inflation. 3. Spindle bearings dry. 	<ol style="list-style-type: none"> 1. Check and tighten any loose connections. See Steering Gear Adjustment. 2. See Maintenance Section. 3. Grease spindles. See Lubrication Section.
Drive belt does not stop when clutch/brake pedal depressed.	<ol style="list-style-type: none"> 1. Belt stops or belt tension out of adjustment. 	<ol style="list-style-type: none"> 1. See authorized service dealer.

TROUBLESHOOTING THE MOWER

SYMPTOM	PROBLEM	SOLUTION
Mower cut is uneven.	<ol style="list-style-type: none"> 1. Mower not leveled properly. 2. Tractor tires not inflated equally or properly. 	<ol style="list-style-type: none"> 1. See Mower Adjustment. 2. See Maintenance Section.
Mower cut is rough looking.	<ol style="list-style-type: none"> 1. Engine speed too slow. 2. Ground speed too fast. 3. Blades are dull. 4. Mower drive belt slipping because it is oily or worn. 5. Mower drive belt slipping because PTO clutch is out of adjustment. 6. Blades not properly fastened to arbors. 	<ol style="list-style-type: none"> 1. Set to full throttle. 2. Slow down. 3. Sharpen or replace blades. See Mower Blade Service. 4. Clean or replace belt as necessary. 5. See PTO Clutch Adjustment. 6. See Servicing the Mower Blades.
Engine stalls easily with mower engaged.	<ol style="list-style-type: none"> 1. Engine speed too slow. 2. Ground speed too fast. 3. Cutting height set too low. 4. Discharge chute jamming with cut grass. 	<ol style="list-style-type: none"> 1. Set to full throttle. 2. Slow down. 3. Cut tall grass at maximum cutting height during first pass. 4. Cut grass with discharge pointing toward previously cut area.
Excessive mower vibration.	<ol style="list-style-type: none"> 1. Blade mounting screws are loose. 2. Mower blades, arbors, or pulleys are bent. 3. Mower blades are out of balance. 4. Belt installed incorrectly. 5. PTO Clutch out of adjustment. 	<ol style="list-style-type: none"> 1. Tighten to 45-55 ft.lbs. (61-75 N.m.). 2. Check and replace as necessary. 3. Remove, sharpen, and balance blades. See Maintenance Section. 4. Reinstall Correctly. 5. See PTO Clutch Adjustment.
Excessive belt wear or breakage.	<ol style="list-style-type: none"> 1. Bent or rough pulleys. 2. Using incorrect belt. 3. PTO Clutch out of adjustment. 	<ol style="list-style-type: none"> 1. Repair or replace. 2. Replace with correct belt. 3. See PTO Clutch Adjustment.
Mower drive belt slips or fails to drive.	<ol style="list-style-type: none"> 1. Idler pulley or arbor bearing seized. 2. Mower drive belt broken. 3. PTO Clutch out of adjustment. 	<ol style="list-style-type: none"> 1. Repair or replace as needed. 2. Replace drive belt. 3. See PTO Clutch Adjustment.

WARNING

Engage parking brake, disengage PTO, stop engine, disconnect spark plug wire(s), and remove key before performing service.

SEAT ADJUSTMENT

The seat can be adjusted forward and back. Loosen the four seat adjustment capscrews (A, Figure 26), slide the seat to the desired position, and tighten the capscrews.

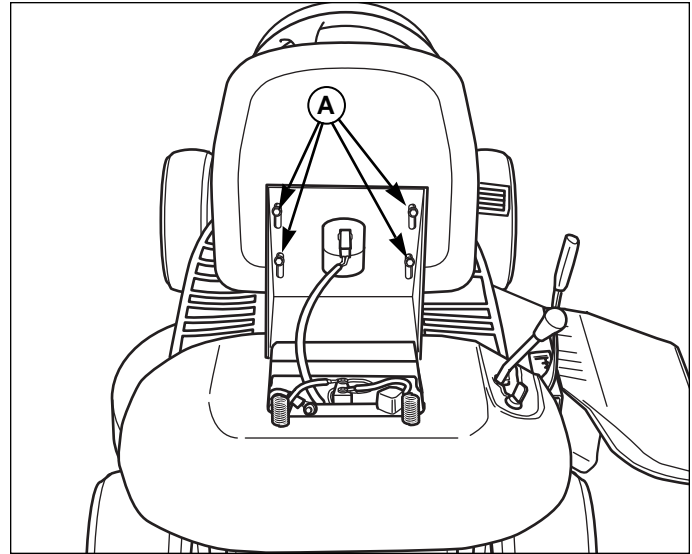


Figure 26. Seat Adjustment

A. Capscrews

STEERING GEAR ADJUSTMENT

If there is excessive slack in the steering system, the steering gear backlash can be removed.

1. See Figure 27. Loosen the two nuts and adjust the bracket so the gear teeth are closely meshed.
2. Tighten nuts after adjustment.

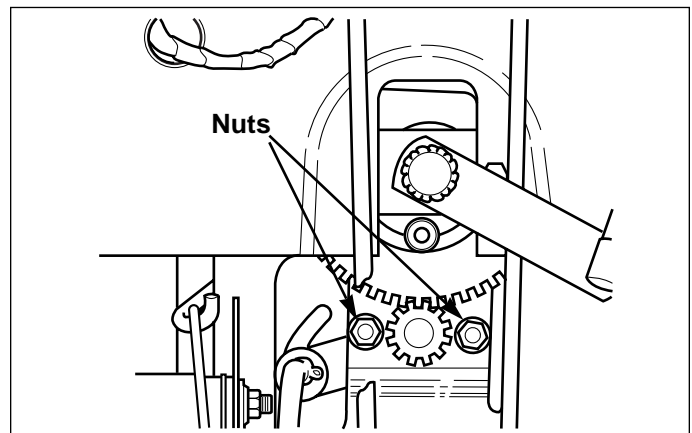


Figure 27. Steering Gear Adjustment

BRAKE & BRAKE SPRING ADJUSTMENT - HYDRO MODELS

NOTE: All hydro brake adjustment is accomplished through brake spring adjustment.

1. Fully depress brake pedal and lock parking brake.
2. See Figure 28. With the tractor parked on a level surface adjust the brake rod nut (A) until spring (B) is compressed to a length of 1-11/16" to 1-3/4" (4.30 cm to 4.45 cm).
3. Check the adjustment by backing the tractor up a hill, engaging the parking brake, and shutting off the engine. While seated in the operator's position park the tractor for at least 30 seconds and watch for movement.

If the parking brake does not hold, tighten the spring.

If the parking brake cannot be engaged, loosen the brake spring.

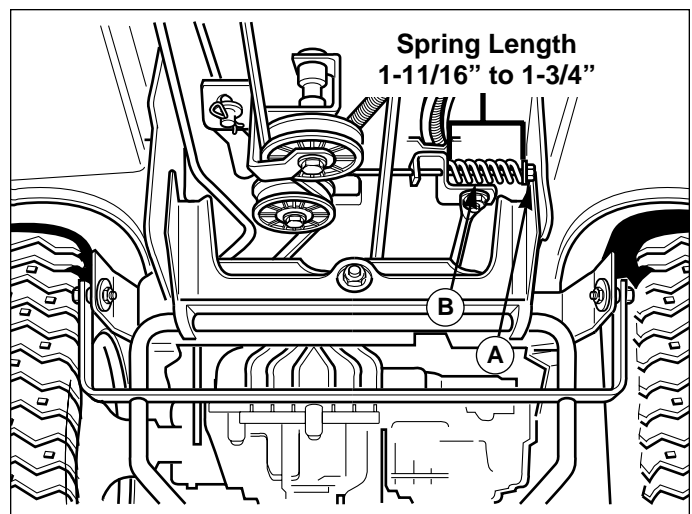


Figure 28. Brake Spring Adjustment - Hydro Models

A. Nut

B. Spring

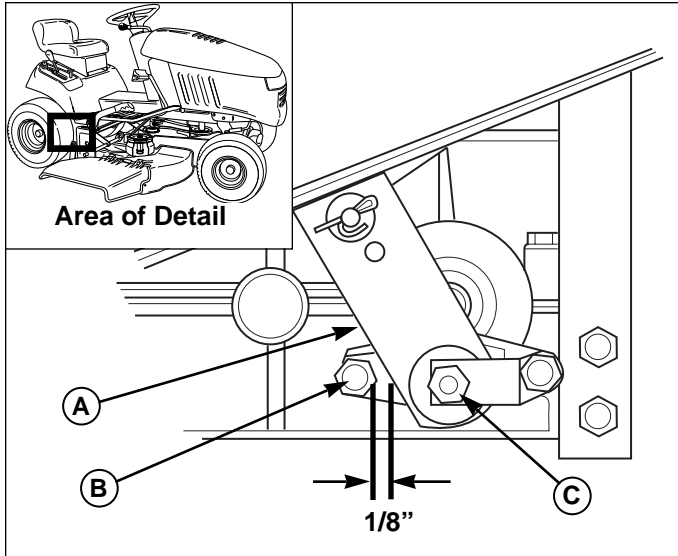


Figure 29. Brake Adjustment - Gear Models

- A. Brake Cam Lever
- B. Stop
- C. Adjustment Nut

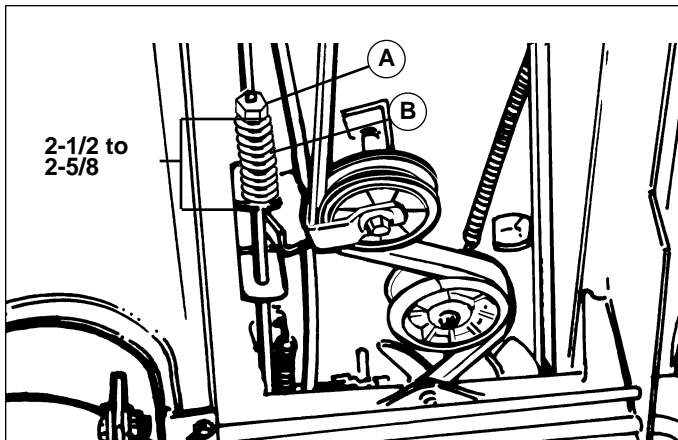


Figure 30. Brake Spring Adjustment - Gear Models

- A. Nut
- B. Spring

BRAKE & BRAKE SPRING ADJUSTMENT - GEAR MODELS

1. Place the transmission in gear and release the parking brake.
2. See Figure 29. Move the brake cam lever (A) forward. There should be a 1/8" (32 mm) gap between the lever (A) and the stop (B) as shown.
3. To adjust clearance, turn nut (C) clockwise to decrease the gap or turn nut counterclockwise to increase the gap.
4. See Figure 30. Set the parking brake. Loosen or tighten adjustment nut (C) to achieve a 2-1/2" to 2-5/8" (6.35 cm to 6.67 cm) compressed spring length as shown.

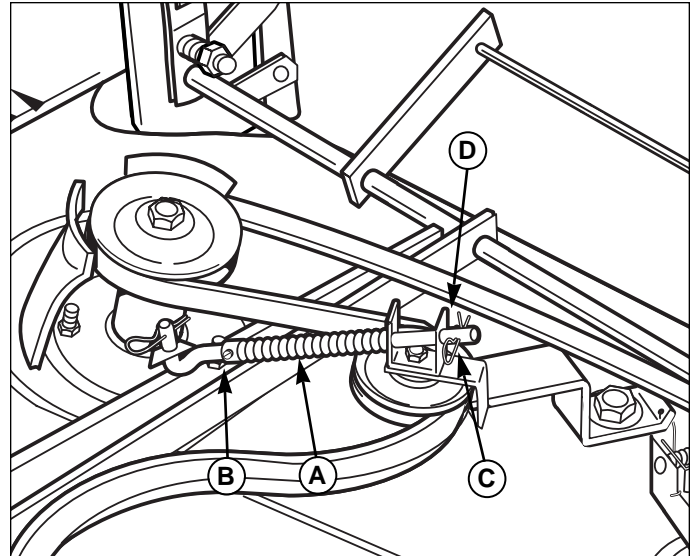


Figure 31. PTO Clutch Adjustment

- A. Clutch Spring
- B. Set Collar
- C. Cotter Pin
- D. U-Shaped Bracket

MOWER ADJUSTMENTS

PTO Clutch Adjustment

The PTO clutch adjustment should be checked when a new belt is installed or if the mower belt is slipping.

1. Install the mower deck on the tractor (the mower shown in Figure 31 was removed for clarity).
2. Stop the engine, remove the key, set the parking brake, and disconnect the spark plug wire(s).
3. Disengage the PTO lever.
4. Loosen the set collar (B).
5. Pull the clutch rod back until the cotter pin (C) contacts the U-shaped bracket (D). Slide the set collar (B) forward to remove all slack from the clutch rod and spring assembly. The collar should be touching the spring, but not compressing it.
6. Tighten the set collar (B).
7. Engage the PTO lever.
8. Measure the length of the compressed clutch spring (A). The spring should be 2-7/8" to 3" (7.3 cm to 7.62 cm) when compressed. If the spring is not within this range, proceed to the next step.
9. Disengage the PTO. Loosen the set collar and move the cotter pin (C) to the middle or outermost hole in the clutch rod.
10. Repeat steps 5-8.

WARNING

Before checking mower, shut off engine and disengage PTO. Allow all moving parts to stop. Remove ignition key, then disconnect the spark plug wire and fasten it away from the spark plug.

Leveling The Mower

If the cut is uneven, the mower may need leveling. Unequal or improper tire pressure may also cause an uneven cut. Tire pressure should be as follows:

- Front: 12 - 15 psi (82-103 kPa)
- Rear: 10 - 12 psi (56-82 kPa)

SIDE-TO-SIDE ADJUSTMENT

1. With the mower installed, place the tractor on a smooth, level surface such as a concrete floor. Turn the front wheels straight forward.
2. Check for bent blades and replace if necessary.
3. Place the mower in high-cut position. Arrange the mower blades so that they are pointing from side-to-side (Figure 32).
4. See Figure 34. Measure the distance between the outside tips of the outer blades and the ground. If there is more than 1/8" (3mm) difference between the measurements on each side, proceed to step 5. If the difference is 1/8" (3mm) or less, proceed to step 6.
5. See Figure 33. Loosen the outside nut (A) and tap-tite screw (C), then turn the eccentric nut (B) to raise or lower the left side of the deck. When the mower deck is level, hold the eccentric nut while tightening the outside nut. Tighten the tap-tite screw (C).

FRONT-TO-BACK ADJUSTMENT

1. Arrange the blades so they face front-to-back (Figure 35).
2. See Figure 34. Measure the distance from the ground to the front and rear tips of the blades as shown. Front tips should be equal to rear tips or within 1/8" higher. If not, proceed to step 3.

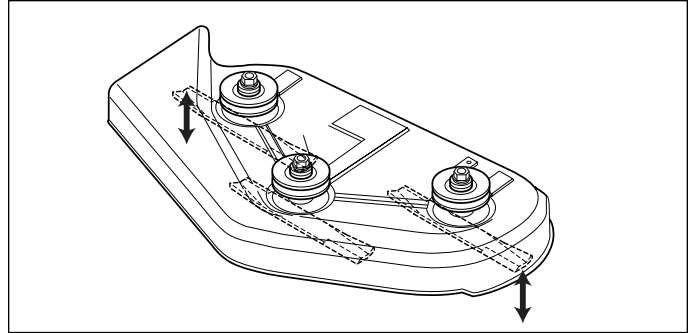


Figure 32. Orient Blades Side-to-Side

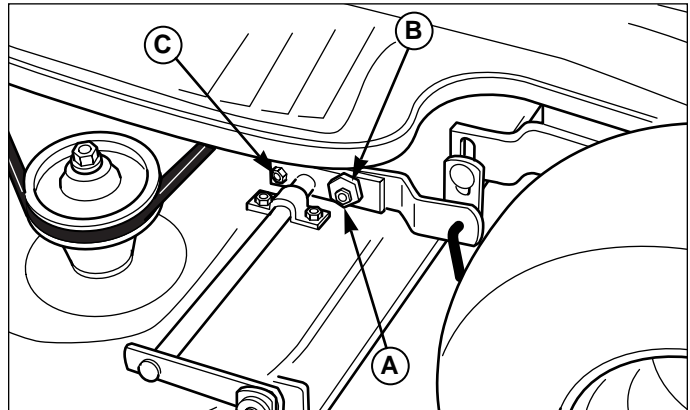


Figure 33. Side-to-Side Adjustment

- A. Outside Nut
- B. Eccentric Nut
- C. Tap-tite Screw

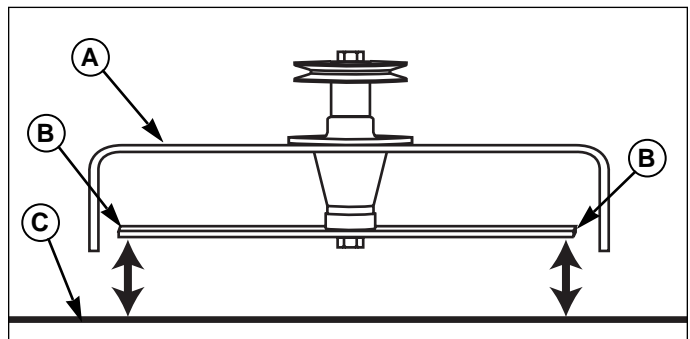


Figure 34. Measure Blade Tips to Ground

- A. Mower Deck
- B. Blade Tips
- C. Level Ground

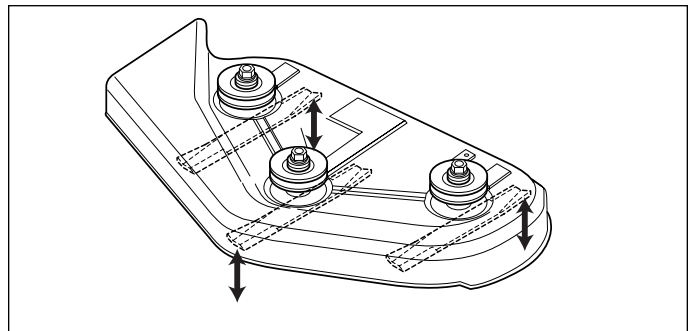


Figure 35. Orient Blades Front-to-Back

3. See Figure 36. Loosen the outside nut (A) and turn the eccentric nut (B) to raise or lower the rear of the deck. When the mower deck is level, hold the eccentric (B) while tightening the outside nut (A).

NOTE: If mower handle drops out of cutting height quadrant, turn adjustment nut (A, Figure 37) clockwise to increase spring tension. DO NOT tighten nut all the way so that the spring is solid.

BLADE BRAKE CHECK

Mower blades and mower drive belt should come to a complete stop within five seconds after the PTO lever is disengaged.

1. With tractor in neutral, PTO disengaged and operator in seat, start the engine.
2. Engage the PTO and wait several seconds. Disengage the PTO and check the amount of time it takes for the mower drive belt to stop.
3. If mower drive belt does not stop within five seconds, see your dealer.

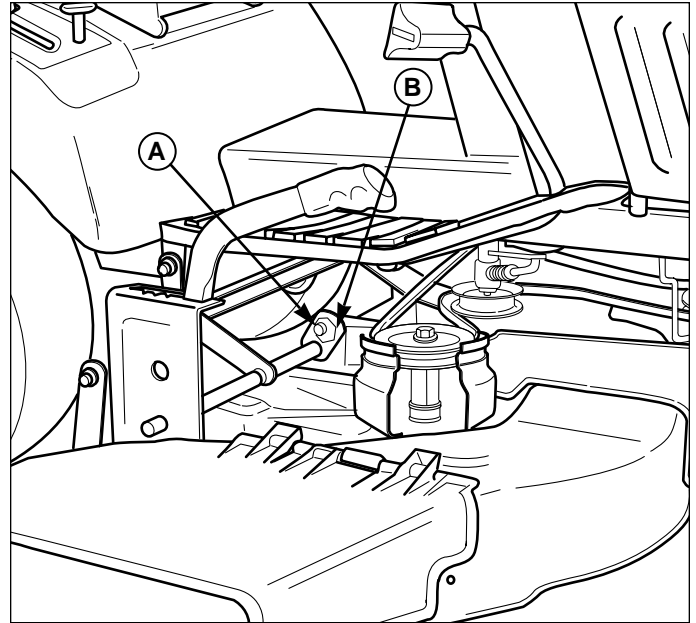


Figure 36. Front-to-Back Adjustment Nut

- A. Nut
- B. Eccentric

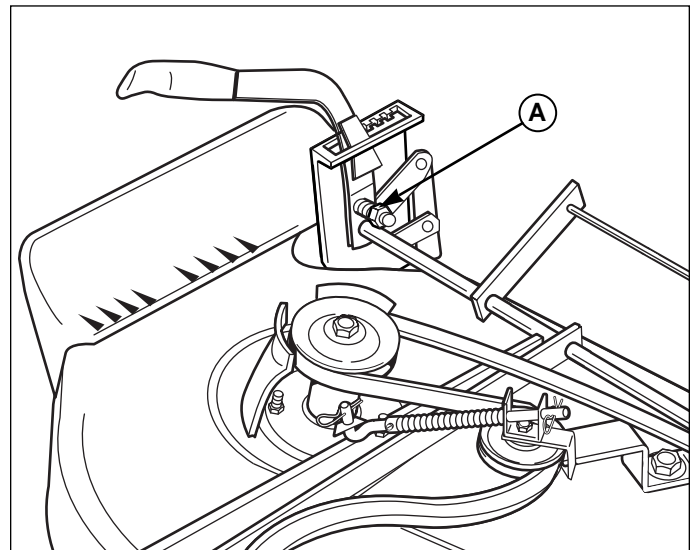


Figure 37. Handle Tension Adjustment

- A. Adjustment Nut

MOWER BELT REPLACEMENT

38" Mowers

1. Park the tractor on a level surface. Disengage the PTO, turn off the engine and set the parking brake. Remove the key.
2. Remove the mower deck from the tractor. See Mower Installation & Removal in the Operation section.
3. Loosen the nuts securing the belt guides (A, Figure 38).
4. Note the position of the idler pulley belt guide (B). Loosen the idler pulley capscrew.
4. Remove the old belt from the pulleys and install the new belt as shown in Figure 38.
5. Tighten the belt guide nuts.
6. Return the idler pulley belt guide (B) to its original position and tighten the idler pulley capscrew.
7. Reinstall the mower deck on the tractor.

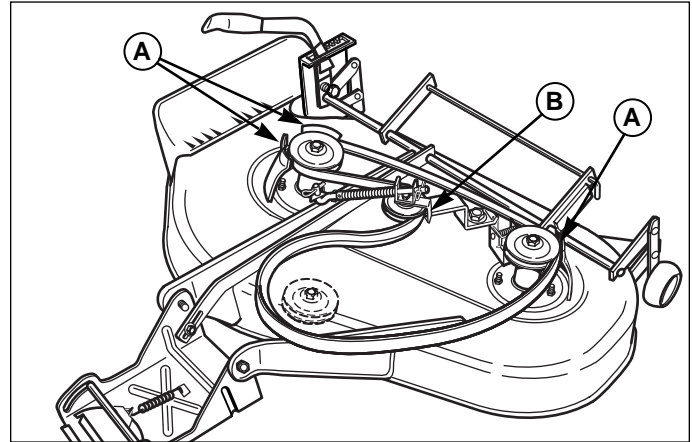


Figure 38. Mower Deck Belt Routing - 38" Deck

- A. Belt Guides
- B. Idler Pulley Belt Guide

TRACTOR DRIVE BELT REPLACEMENT



To avoid damaging belts, DO NOT PRY BELTS OVER PULLEYS.

All Models

1. Park the tractor on a level surface. Disengage the PTO, turn off the engine and set the parking brake. Remove the key.
2. Remove the mower deck from the tractor. See Mower Installation & Removal.
3. Loosen the bolts securing the engine pulley belt guide (A, Figure 40).
4. Remove the rear drag link hardware (B, Figure 40). When reassembling, apply thread locking compound to nut before tightening.
5. **Gear models**, disconnect the wires from the neutral switch on the transmission.
- Hydro models**, loosen the belt stop on the transmission pulley. Belt stop hardware is located on the inside of RH frame. Move belt stop out of the way. Belt stop should be positioned 1/8" from belt when new belt is installed and hardware is tightened.
6. Note the position of the idler pulley belt guide. Loosen hardware securing the idler pulleys (C, Figure 40).
7. Carefully slide belt over transmission pulley and remove from the idler pulleys (C, Figure 40).
8. Install new belt as shown in Figure 39.
9. Return the idler pulley belt guide to its original position and tighten the idler pulley hardware.
8. Reverse steps 1-5.

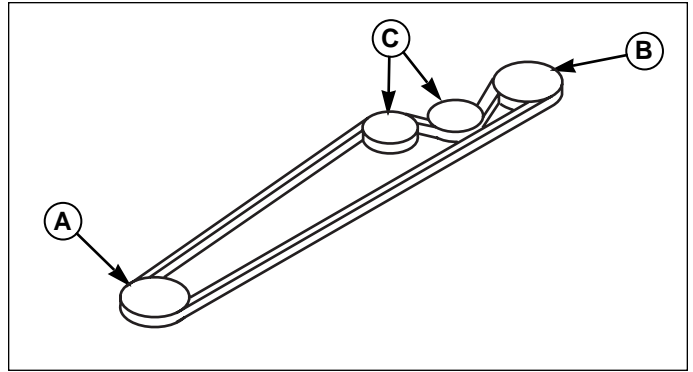


Figure 39. Drive Belt Routing - All Models

A. Engine Pulley C. Idler Pulleys
B. Transmission Pulley

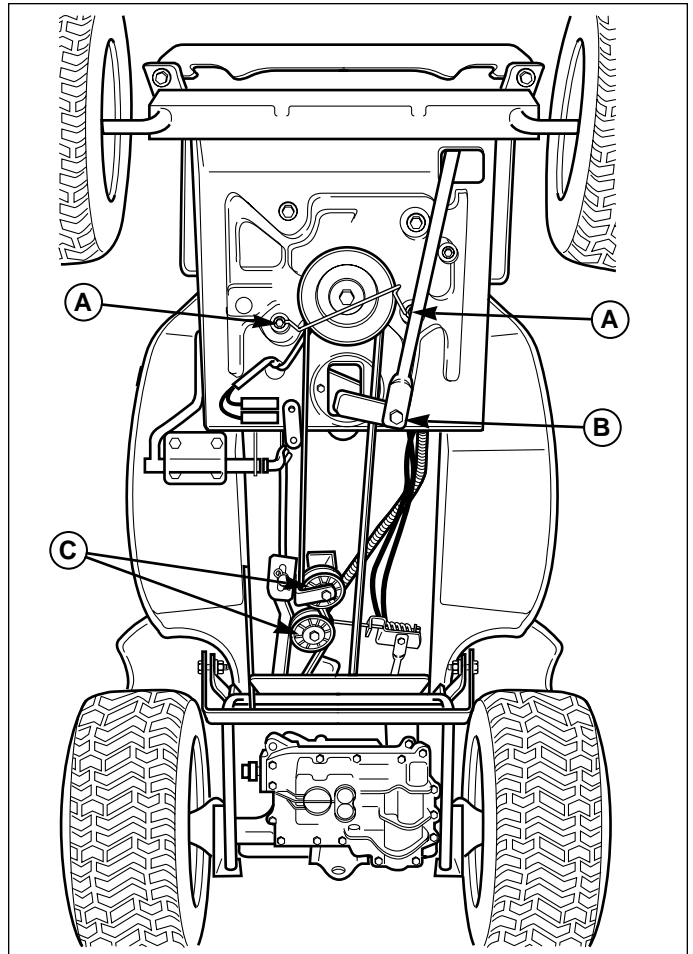


Figure 40. Drive Belt Replacement

A. Belt Stop Bolts
B. Drag Link Hardware
C. Idler Pulleys

BATTERY SERVICE

WARNING

Keep open flames and sparks away from the battery; the gasses coming from it are highly explosive. Ventilate the battery well during charging.

Checking Battery Voltage

A voltmeter can be used to determine condition of battery. When engine is off, the voltmeter shows battery voltage, which should be 12 volts. When engine is running, the voltmeter shows voltage of charging circuit which normally is 13 to 14 volts.

A dead battery or one too weak to start the engine may not mean the battery needs to be replaced. For example, it may mean that the alternator is not charging the battery properly. If there is any doubt about the cause of the problem, see your dealer. If you need to replace the battery, follow the steps under Cleaning the Battery & Cables in the Regular Maintenance Section.

WARNING

Do not attempt to charge a frozen battery. Allow the battery to warm to 60° F (15.5° C) before placing on charger.

Charging a Completely Discharged Battery

1. Be aware of all the safety precautions you should observe during the charging operation. If you are unfamiliar with the use of a battery charger and hydrometer, have the battery serviced by your dealer.
2. Add water sufficient to cover the plate (fill to the proper level near the end of the charge). If the battery is extremely cold, allow it to warm before adding water because the water level will rise as it warms. Also, an extremely cold battery will not accept a normal charge until it becomes warm.
3. Always unplug or turn the charger off before attaching or removing the clamp connections.
4. Carefully attach the clamps to the battery in proper polarity (usually red to [+] positive and black to [-] negative).
5. While charging, periodically measure the temperature of the electrolyte. If the temperature exceeds 125° F (51.6° C), or if violent gassing or spewing of electrolyte occurs, the charging rate must be reduced or temporarily halted to prevent battery damage.
6. Charge the battery until fully charged (i.e. until the specific gravity of the electrolyte is 1.250 or higher and the electrolyte temperature is at least 60° F). The best method of making certain a battery is fully charged, but not over charged, is to measure the specific gravity of a cell once per hour. The battery is fully charged when the cells are gassing freely at low charging rate and less than 0.003 change in specific gravity occurs over a three hour period.

Jump Starting With an Auxiliary (Booster) Battery

Jump starting is not recommended. However, if it must be done, follow these directions. Both booster and discharged batteries should be treated carefully when using jumper cables. Follow the steps below EXACTLY, being careful not to cause sparks. Refer to Figure 41.

1. Both batteries must be of the same voltage.
2. Position the vehicle with the booster battery adjacent to the vehicle with the discharged battery so that booster cables can be connected easily to the batteries in both vehicles. Make certain vehicles do not touch each other.
3. Wear safety glasses and shield eyes and face from batteries at all times. Be sure vent caps are tight. Place damp cloth over vent caps on both batteries.
4. Connect positive (+) cable to positive post of discharged battery (wired to starter or solenoid).
5. Connect the other end of same cable to same post marked positive (+) on booster battery.
6. Connect the second cable negative (-) to other post of booster battery.
7. Make final connection on engine block of stalled vehicle away from battery. Do not lean over batteries.
8. Start the engine of the vehicle with the booster battery. Wait a few minutes, then attempt to start the engine of the vehicle with the discharged battery.
9. If the vehicle does not start after cranking for thirty seconds, STOP PROCEDURE. More than thirty seconds seldom starts the engine unless some mechanical adjustment is made.
10. After starting, allow the engine to return to idle speed. Remove the cable connection at the engine or frame. Then remove the other end of the same cable from the booster battery.
11. Remove the other cable by disconnecting at the discharged battery first and then disconnect the opposite end from the booster battery.
12. Discard the damp cloths that were placed over the battery vent caps.

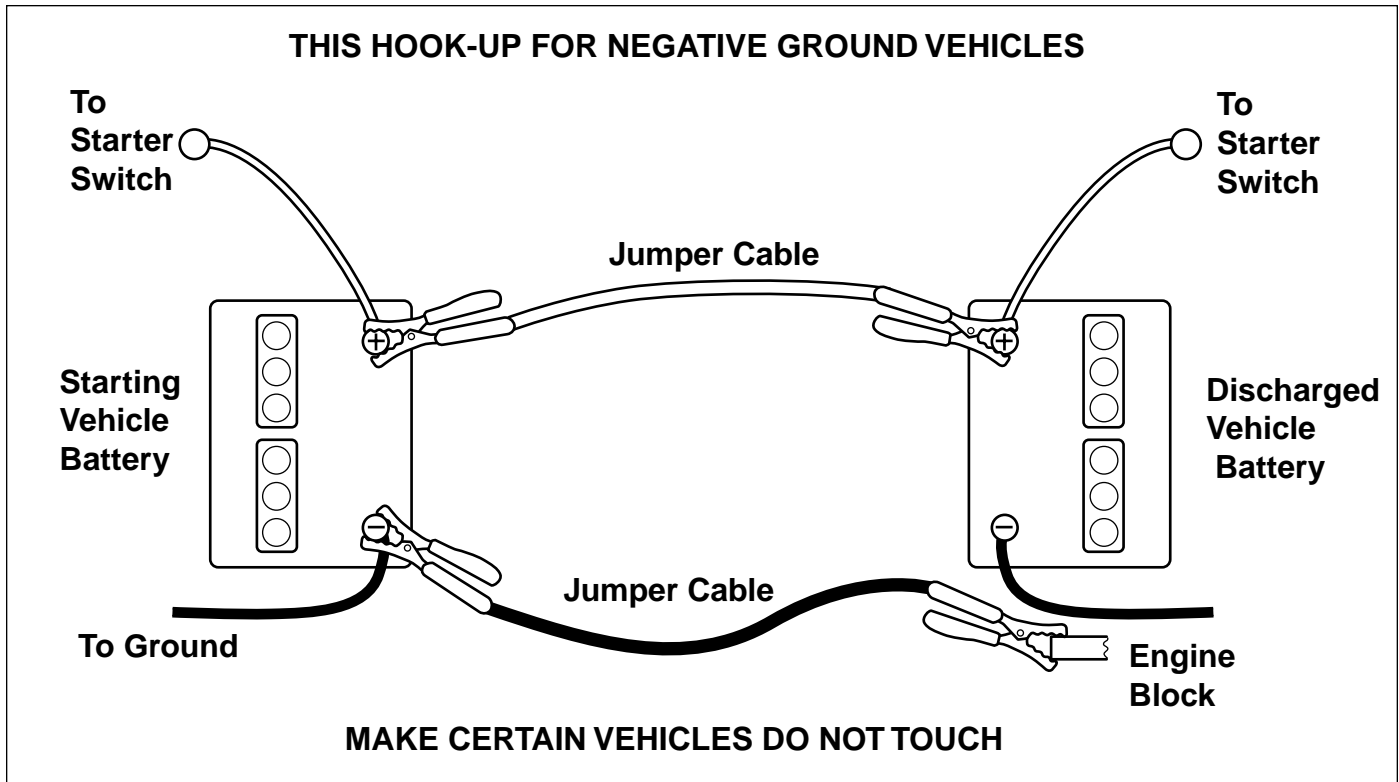


Figure 41. Battery Jump Starting Diagram

⚠ WARNING

Any procedure other than the preceding could result in:

- (1) personal injury caused by electrolyte squirting out the battery vents,
- (2) personal injury or property damage due to battery explosion,
- (3) damage to the charging system of the booster vehicle or of the immobilized vehicle.

Do not attempt to jump start a vehicle having a frozen battery because the battery may rupture or explode. If a frozen battery is suspected, examine all fill vents on the battery. If ice can be seen or if the electrolyte fluid cannot be seen, do not attempt to start with jumper cables as long as the battery remains frozen.

⚠ WARNING

For your personal safety, use extreme care when jump starting. Never expose battery to open flame or electric spark – battery action generates hydrogen gas which is flammable and explosive. Do not allow battery acid to contact skin, eyes, fabrics, or painted surfaces. Batteries contain a sulfuric acid solution which can cause serious personal injury or property damage.

When removing or installing battery cables, disconnect the negative cable **FIRST** and reconnect it **LAST**. If not done in this order, the positive terminal can be shorted to the frame by a tool.

To avoid engine damage, do not disconnect battery while engine is running. Be sure terminal connections are tight before starting.

TRANSMISSION PURGING

The following procedure applies to the Tuff Torq K-51 hydrostatic transaxle. Purge the transmission if the unit lacks drive in forward or reverse.

1. See Figure 42. Block the front wheels. Elevate the rear end of the tractor using a chain hoist or floor jack. Support the rear of the unit using jackstands. Elevate the unit just high enough for the rear wheels to clear the ground.
2. Activate the seat switch (A, Figure 42), depress the clutch / brake pedal (B, Figure 43), and start the engine. After the engine has started, set throttle (A) to IDLE.
3. Release the brake pedal (B) and move the ground speed lever (C) fully forward.
4. While holding the ground speed control in forward position, engage and disengage the transmission release valve lever (Figure 43) several times.
5. Move the ground speed lever (C, Figure 43) to full reverse.
6. While holding the ground speed control in reverse, engage and disengage the transmission release valve lever (Figure 44) several times.
7. Engage the transmission release valve lever (Figure 44) and move the ground speed lever (C, Figure 43) from full forward to full reverse several times.
8. Lower the tractor and test run for several minutes.

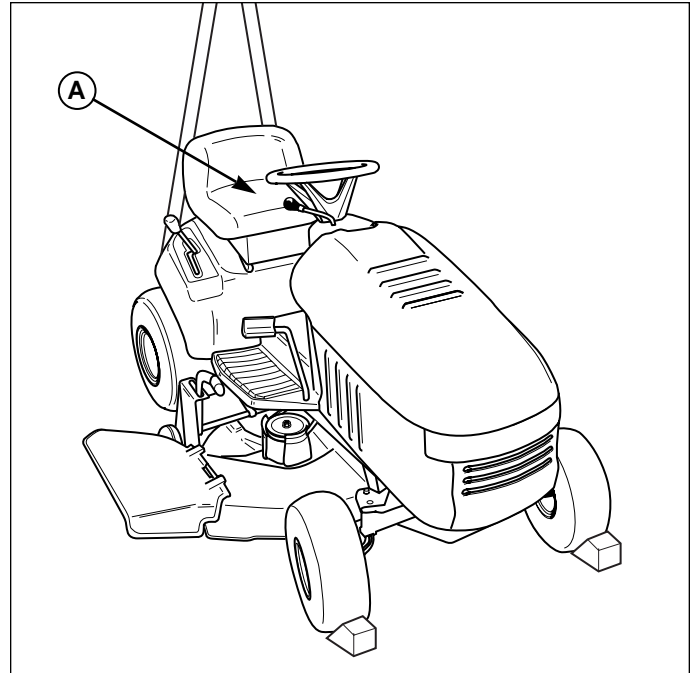


Figure 42. Elevate the Rear End of the Tractor

A. Seat Switch

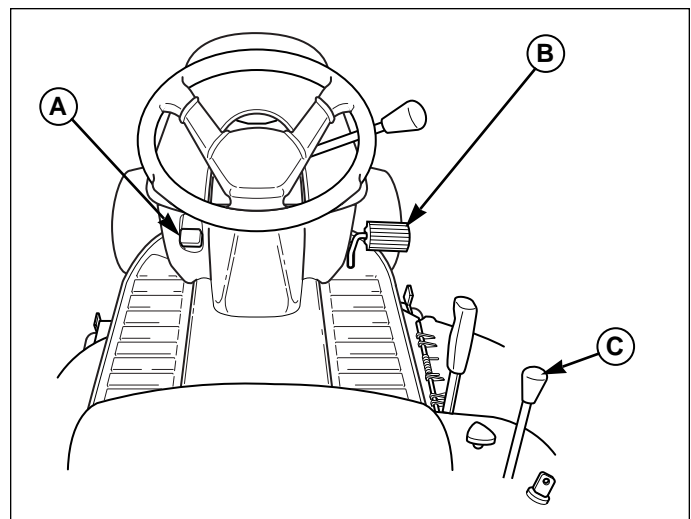


Figure 43. Controls

A. Throttle

C. Ground Speed Lever

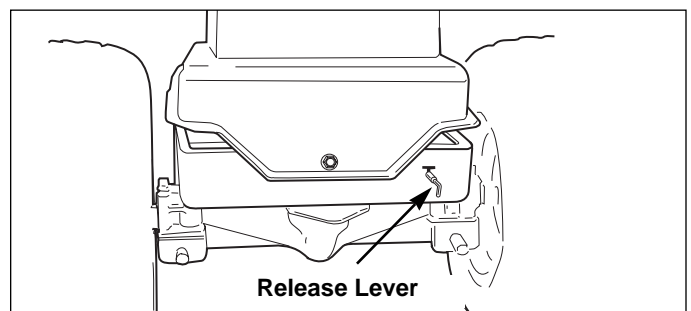


Figure 44. Release Lever - Hydro Models



Specifications

NOTE: Specifications are correct at time of printing and are subject to change without notice.

ENGINE

15.5 HP Briggs & Stratton Intek

Make	Briggs & Stratton
Model	Intek
Horsepower	15.5 @ 3600 rpm
Cylinder	1
Bore	3.44 in (88 mm)
Stroke	3.06 in (76.5 mm)
Displacement	28.4 Cu. in (465 cc)
Construction	Overhead Valve, Cast-Iron Sleeve, Aluminum Crankcase
Electrical System	12 Volt, 3 amp. Alternator Unregulated Battery: 200 Cold Cranking amps, 23 Min. Reserve Capacity
Ignition	High Energy Electronic Ignition
Air Cleaner	Ducted Paper Cartridge & Foam Pre-cleaner
Lubrication	Splash Lubrication
Oil Capacity	48 Oz. (1.42 L)
Fuel Tank	Material: High Density Polyethylene, Transparent Capacity: 2.0 Gallons (7.5 L)
Muffler	Compact, Low Back Pressure

14.5 HP Briggs & Stratton Intek

Make	Briggs & Stratton
Model	Intek
Horsepower	14.5 @ 3600 rpm
Cylinder	1
Bore	3.44 in (88 mm)
Stroke	3.06 in (76.5 mm)
Displacement	28.4 Cu. in (465 cc)
Construction	Overhead Valve, Cast Iron Sleeve, Aluminum Crankcase
Electrical System	12 Volt, 3 amp Alternator Unregulated Battery: 200 Cold Cranking amps, 23 Minute Reserve Capacity
Ignition	High Energy Electronic Ignition
Air Cleaner	Ducted Paper Cartridge & Foam Pre-cleaner
Lubrication	Splash Lubrication
Oil Capacity	48 Oz. (1.42 L)
Fuel Tank	Material: High Density Polyethylene, Transparent Capacity: 2.0 Gallons (7.5 L)
Muffler	Compact, Low Back Pressure

TRANSMISSION

Hydro Models

Type	Hydrostatic Tuff Torq K51
Pump	Variable Displacement Axial Piston
Motor	Fixed Displacement Axial Piston
Control	Single Lever Hand Control
Movement	Free-Wheeling Lever for Manual Tractor
Hydraulic Fluid	10w 30 Premium Engine Oil
Speeds	Forward: 0-5.2 MPH (8.3 km/h)
@ 3400 rpm	Reverse: 0-3 MPH (4.8 km/h)
Differential	Bevel Gear Type
Axle Shaft	.75 in
Continuous Torque Output	170 ft. lbs.
Drawbar Rating	243 lbs.
Maximum Weight on Axle	673 lbs.

Gear Models

Type	Peerless MST 205
Material	Shaft: Hardened Bearings: Needle Roller & Bushings
Lubrication	EP 90 Oil
Speeds	Five Forward, One Reverse
Speeds @ 3400 rpm	1st: 1.0 MPH (1.6 km/h) 2nd: 2.0 MPH (3.2 km/h) 3rd: 3.0 MPH (4.8 km/h) 4th: 4.2 MPH (6.7 km/h) 5th: 4.7 MPH (7.5 km/h) Rev: 1.4 MPH (2.2 km/h)
Differential	Bevel Gear Type
Axle Shaft	.75 in
Continuous Torque Output	225 ft. lbs.
Drawbar Rating	321 lbs.
Maximum Weight on Axle	525 lbs.

CHASSIS

All Models

Frame	Heavy Gauge Steel Channel - 12/14 Gauge Engine Mounting: Above Front Axle Pivot Point Location: Rear Carrier
Rear Wheels	Tire Size: 18 x 8.50-8 Turf Type Pneumatic Inflation Pressure: 10-12 psi (82-103 kPa)
Front Wheels	Tire Size: 15 x 6.00-6 Pneumatic Inflation Press.: 12-15 psi (82-103 kPa) Bearings: Sintered Iron with Grease Fittings Hood Tips Forward, Seat Tips Forward Medium Back, Adjustable Inside Rear Tire: 14 in (36 cm)
Accessibility	
Seat	
Turning Radius	

Specifications

CONTROLS

All Models

Steering	15" (38 cm) Steering Wheel Gear and Sector, 1.5 turns Lock to Lock
Clutch/ Brake	Combination Clutch/Brake/Parking Brake Pedal. Parking Brake Lock, Foot/Hand Activated
Location	Mower Height Adjustment: Right Side PTO Clutch-Manual, Dash Ground Speed Lever-Seat Deck R.H. Ignition Key Switch: On Seat Deck Throttle Lever & Choke Lever: (Combined) On Dash Panel

Mower

Material	12 Ga.
Effective Cutting Width	38 in Mower - 38 in (97 cm)
Overall Width with Deflector	49.5 in (126 cm)
Weight	81 lbs. (36.7 kg)
Cutting Height	Variable Between 1.5 and 3.9 in (3.8 and 10 cm)
Blade Arrangement	Two Blades
Mower Drive	V-Belt from Tractor Engine Pulley
Spindle Bearings	Sealed Ball Bearings - Lube Fitting Provided

DIMENSIONS

Tractor

Overall Length	68 in (172 cm)
Overall Width	36 in (92 cm)
Height	At Steering Wheel: 41 in (104 cm) To Top of Engine Cover: 34 in (86 cm)
Wheel Base	50 in (127 cm)
Weight (approx.)	
Net	371 lbs. (168 kg) w/mower 455 lbs. (206 kg)
Shipping	610 lbs. (276 kg) w/38 in Mower
Tractor Length w/Dozer Blade	est. 86 in (218 cm)

COMMON REPLACEMENT PARTS

Use only genuine factory replacement parts. Do not attempt repairs or maintenance unless proper procedures and safety precautions are followed. For assistance see your dealer.

QTY.	DESCRIPTION	PART NO.
1	Tractor Drive Belt-Hydro Models	1717397
1	Tractor Drive Belt-Gear Models	1665450
1	38" Mower Drive Belt	1716854
1	38" Mower Blade - RH	1704101
1	38" Mower Blade - LH	1704856
1	Fuel Filter	173206
1	Exhaust Screen	1719961
1	Battery	1685215
1	Ignition Key	1717163
2	Headlight Bulb	1677371
1	Interlock Switch - PTO	1717050
1	Interlock Switch - Neutral (Hydo Models)	1665586
1	Interlock Switch - Neutral (Gear Models)	1654634
1	Interlock Switch - Seat	1714711
	Interlock Switch - Foot pedals	
1	- Switch, Black (normally open)	1704379
1	- Switch, Gray (normally closed)	1714770

MAINTENANCE ITEMS

DESCRIPTION	PART NO.
Engine Oil	
SAE 5W-30 SF/CD (Cold Weather 30° & under)	1685576
SAE 30W SG/CC (Warm weather 32° & up)	1685659
Touch-Up Paint	
Metallic Grey, 13 oz. spray can	1685718
Cardinal Red, 13 oz. spray can	1686772
Cardinal Red, Case of 12 spray cans	1686774
Cardinal Red, 1 quart can	1686773
Grease Gun Kit w/8 oz. Grease Tube	1685510
Replacement 8 oz. Grease Tube for above	103077
Tire Sealant 11 oz. Tube	1685523
Degreaser/Degreaser	
32 oz. Bottle w/Trigger Spray	1685619
1 gallon	1685621
Gas Stabilizer	
8 oz. Bottle	1685748
Case of 12 - 8 oz. Bottles	1685747
Dielectric Silicone Compound	1685799

OPTIONAL ACCESSORIES

42" Dozer/Snow Blade	Grass Mulcher/Leaf Shredder
Rear Wheel Weights	Front Counterweight
Tire Chains	Dump Cart
Twin Bag Grass Catcher	Gas Cans



Lawn Care & Mowing Information

GENERAL INFORMATION

Proper mowing is an important part of maintaining your lawn in the best possible condition. A healthy and well maintained lawn is better able to resist drought, weeds, and other stresses. But too much maintenance is as detrimental to your lawn as neglect. Proper care for your lawn involves more than just “cutting the grass.” To have a healthy lawn, you need to know:

- ✗ Types of Grass, Climate and Conditions
- ✗ How and When to Water, Fertilize & Aerate
- ✗ How High to Mow the Grass
- ✗ When and How Often to Mow
- ✗ What Mowing Patterns to Use
- ✗ Proper Mowing Methods
- ✗ How to Solve Common Mowing Problems

TYPES OF GRASS, CLIMATE AND CONDITIONS

A variety of grasses are commonly grown in household lawns, but two main groups known as cool-season grasses (varieties of bluegrass, ryegrass, and fescue), and warm-season grasses (typically bermuda, buffalo-grass, and zoysia varieties) are the most common.

The cool-season grasses are better suited to cooler climates, and do not endure hot and dry weather as well as warm-season grasses, but conversely, the warm-season grasses do not grow as well in cooler climates. Most residential lawns are typically seeded with a mixture of these grasses. (A local nursery or lawn center may help you to identify what kind of grass your lawn contains from a sample.)

Knowing your climate and conditions is also important to proper lawn care. Drier climates or conditions will require additional watering, while wetter climates may require more frequent mowing.

HOW AND WHEN TO WATER, FERTILIZE & AERATE

Every lawn's watering needs are unique and are dependent upon the type of grass and soil, the amount of local rainfall, and other conditions. **Most lawns are watered too often, but with too little water.** However too much water can allow development of diseases with your lawn. **It is best to water the lawn only when necessary, and then to water it slowly, evenly, and deeply—imitating a slow, soaking rain.**

WHEN TO WATER YOUR LAWN

When the lawn begins to wilt, the grass's color dulls, or footprints stay compressed for more than a few seconds, the lawn is beginning to dry out, and needs additional moisture. The best time to water is early morning to allow the water to soak deeply into the lawn and reduce the amount that evaporates in the hot afternoon sun.



HOW TO WATER YOUR LAWN

The best method of watering a lawn is to imitate a slow, soaking rain, applying about 1 inch of water. A method of verifying the amount that you have watered, is to place several empty tin cans (low shallow cans work best) in various spots around the lawn, and check the depth of water in the can during the watering process.

HOW TO FERTILIZE YOUR LAWN

Fertilizing with a slow-release fertilizer provides missing nutrients which help create slow, even growth. While opinions vary on the need for fertilizing, when and how much to fertilize will be more a factor of the condition of the lawn and soil than any routine. Remember that over-fertilizing can cause harm, and that most fertilizing should be applied in the spring so that it will release into the lawn through the summer. For more information, check with a local nursery or lawn care specialist, and read and follow the fertilizer manufacturer's instructions.

AERATING YOUR LAWN

Consider aerating your lawn in spring. Using an aerator to remove cores of soil from the lawn increases the speed of clipping decomposition and encourages deeper root growth by opening up the soil and permitting greater movement of water, fertilizer and air.

Lawn Care & Mowing Information

HOW HIGH TO MOW THE GRASS

Often cutting height is a matter of personal preference. Typically, you should mow the grass when it is between three and five inches high. The proper cutting height range for a specific lawn will depend upon several factors, including the type of grass, the amount of rainfall, the prevailing temperature, and the lawn's overall condition.

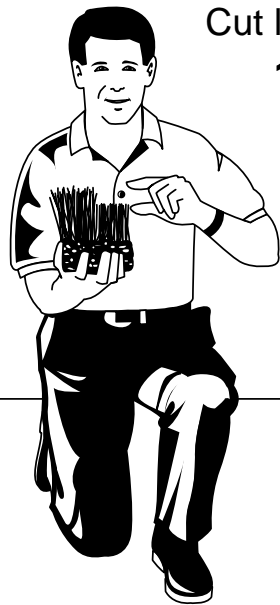
Cutting the grass too short causes weak, thin grass plants, which are easily damaged by dry periods and pests. Cutting too short is often more damaging than allowing the grass to be slightly higher.

Letting grass grow a bit longer—especially when it is hot and dry—reduces heat build-up, preserves needed moisture and protects the grass from heat damage and other problems. However, allowing grass to grow too high can cause thin turf and additional problems.

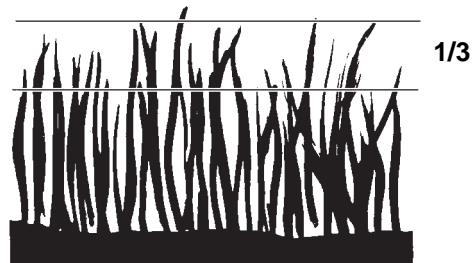
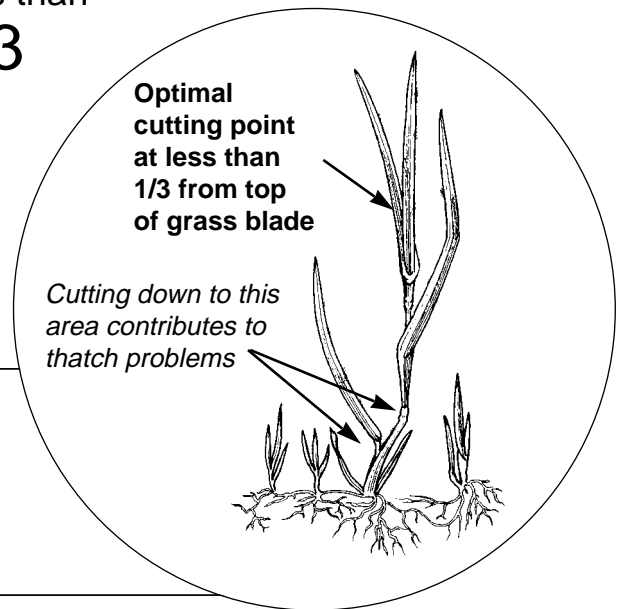
Cutting off too much at one time shocks the plant's growth system and weakens the grass plants. **A good rule of thumb is the 1/3 rule: to cut no more than one third of the grass height, and never more than 1 inch at a time.**

The amount of grass you are able to cut in one pass is also effected by the type of mowing system you are using (for example, broadcasting with side discharge decks can process a much larger volume of grass than mulching does).

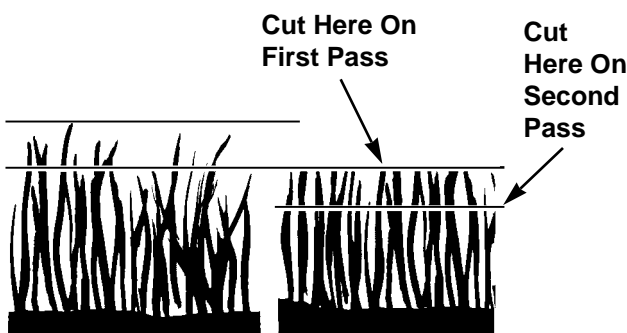
NOTE: We cover some specific mowing instructions for mulching and broadcasting later in this Lawn Care section.



Cut less than
1/3



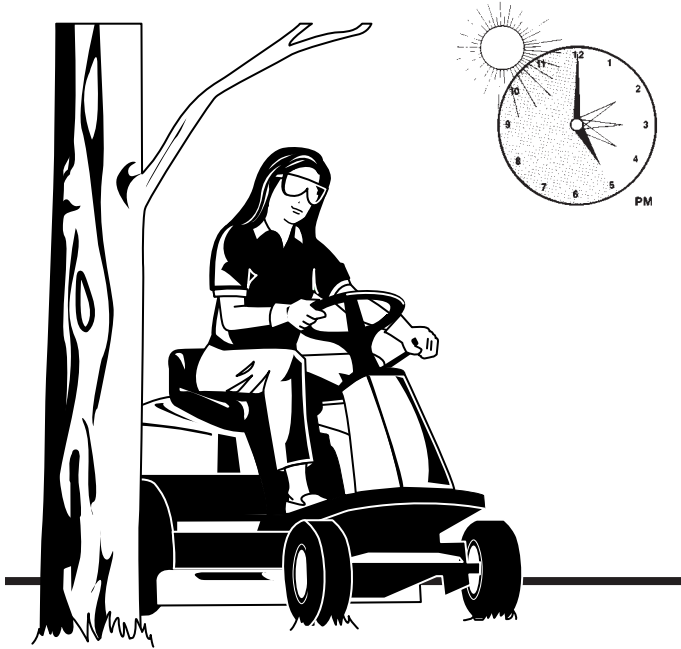
Proper Cutting Height



Tall Grass Requires Incremental Cutting

For extremely tall grass, set the cutting height at maximum for the first pass, and then reset it to the desired height and mow a second or third time.

Don't cover the grass surface with a heavy layer of clippings. Consider using a grass collection system and starting a compost pile.



WHEN AND HOW OFTEN TO MOW

The time of day and condition of the grass greatly affect the results you'll get when mowing. For the best results, follow these guidelines:

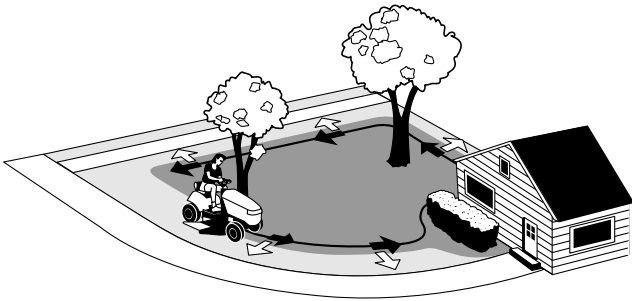
- Mow when the grass is between three and five inches high.
- Mow with sharp blades. Short clippings of grass one inch or shorter decompose more quickly than longer blades. Sharp mower blades cut grass cleanly and efficiently, preventing frayed edges which harm the grass.
- Mow at time of day when the grass is cool and dry. Late afternoon or early evening often provide these ideal mowing conditions.
- Avoid mowing after rain or even heavy dew, and never mulch when the grass is wet (moist grass does not mulch well, and clumps beneath the mower deck).

WHAT MOWING PATTERNS TO USE

Always start mowing on a smooth, level area.

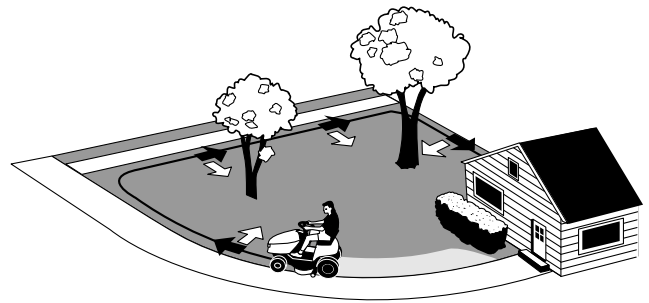
The size and type of area to be mowed will determine the best mowing pattern to use. Obstructions such as trees, fences and buildings, and conditions such as slopes and grades must also be considered.

- Cut long straight strips overlapping slightly.
- Where possible, change patterns occasionally to eliminate matting, graining or a corrugated appearance.
- For a truly professional cut, mow across the lawn in one direction, then recut the lawn by mowing perpendicular to the previous cut.



The remainder of the mowing should be done in the opposite direction so that the clippings are dispersed OUT onto the area of lawn previously cut.

Where possible, make one or two passes around the outside of the area discharging the grass INTO the lawn to keep the cut grass off fences and walks.



Note: Always operate the engine at full throttle when mowing.

If you hear the engine slowing down, you are mowing too fast—using a slower ground speed will improve the cutting efficiency of the blades and prevents many common cutting problems. Use an appropriate ground speed for the thickness and height of the grass you are cutting (3rd gear or slower for manual gear models). If you hear the engine slowing down you are mowing too fast, use a slower ground speed.

Lawn Care & Mowing Information

MOWING METHODS

Proper Broadcast Mowing

Broadcasting, or side-discharging, disperses fine clippings evenly over the entire lawn. Many golf courses use this method. Your mower has a deep dish deck to allow freer circulation of clippings so they are broadcast evenly over the lawn.

ENGINE SPEED & GROUND SPEED FOR BROADCASTING

Always operate the engine at full throttle when mowing. If you hear the engine slowing down, you are mowing too fast—using a slower ground speed will improve the cutting efficiency of the blades and prevents many common cutting problems.

ALWAYS use an appropriate ground speed for the thickness and height of the grass you are cutting (3rd gear or slower for manual gear models). If you hear the engine



slowing down you are mowing too fast, use a slower ground speed.

HOW MUCH GRASS TO CUT OFF WHEN BROADCASTING

Mow when the grass is 3-5 inches long. Do not cut the grass shorter than 2 to 2-1/2 inches. Do not cut off more than 1 inch of grass in a single pass.

Proper Mulching

Mulching consists of a mower deck which cuts and recuts clippings into tiny particles and which then blows them down INTO the lawn. These tiny particles decompose rapidly into by-products your lawn can use. UNDER PROPER CONDI-

TIONS, your mulching mower will virtually eliminate noticeable clippings on the lawn surface.

NOTE: When mulching under heavy cutting conditions, a rumbling sound may be present and is normal.

MULCHING REQUIRES EXCELLENT MOWING CONDITIONS

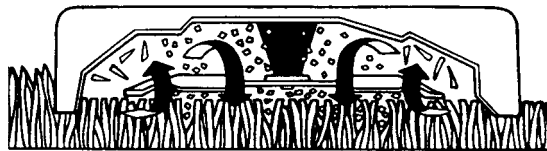
Mulching mowers cannot function properly if the grass is wet, or if the grass is simply too high to cut. Even more than normal mowing, mulching requires that the grass be dry and the appropriate amount is cut.

Do not use the mower as a mulching mower during the first two or three mowings in the spring. The long grass blades, quick growth, and often wetter conditions are more suitable for broadcasting (side-discharging) or grass bagging operation.

ENGINE SPEED & GROUND SPEED FOR BROADCASTING

Use full engine throttle matched with a slow ground speed so that clippings will be finely cut. Ground speed while mulching should be HALF of the speed that would be used when broadcasting (side discharging) under similar conditions. Since mulching requires more horsepower than broadcasting, using a slower ground speed is vitally important for proper mulching operation.

Mulching Action



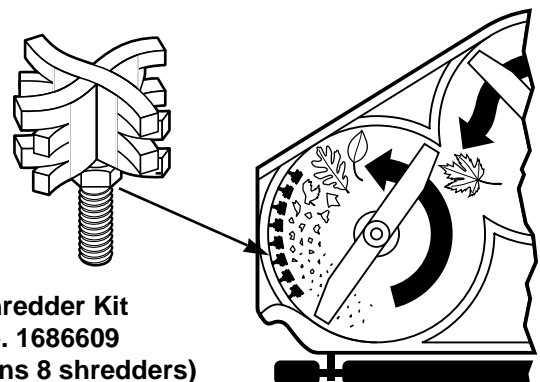
HOW MUCH GRASS TO MULCH

The best mulching action typically results from cutting only the top 1/2 inch to 3/4 inch of grass blade. This provides short clippings which decompose properly (much more quickly than longer clippings). The ideal cutting

height will vary with climate, time of year, and quality of your lawn. We recommend that you experiment with both the cutting height and ground speed until you achieve the best cut. Start with a high cutting height and using progressively lower settings until you find a cutting height that is matched to your mowing conditions and preferences.

LEAF SHREDDING (USE WITH OPTIONAL MULCHER KIT)

Simplicity's patented Shredder Blades virtually eliminate raking leaves. Up to 512 cutting edges pulverize leaves into tiny particles, which quickly and naturally decompose into food for your lawn. The Shredder Blades must be removed when you mulch grass clippings.



Leaf Shredder Kit
Part No. 1686609
(Contains 8 shredders)

TIPS On Dealing With Clippings

Clippings are **beneficial** to your lawn. A common misconception about clippings is that they automatically lead to thatch—this is untrue. Short clippings produced by broadcasting and clippings produced by mulching methods actually **contribute to a healthy lawn** because they:

- ✗ Reduce the evaporation of water from your lawn.
- ✗ Provide a cushioning layer to reduce lawn wear.
- ✗ Moderate soil temperature.
- ✗ Clippings act as a safe, non-polluting and inexpensive fertilizer that nourishes your lawn. Fresh cut grass blades are 85% water, and are a rich source of nitrogen which is essential to lush growth. And one garbage bag of clippings contains about 1/4 lb. of usable organic nitrogen.

COMPOSTING

The best way to recycle excess clippings and leave your lawn looking immaculate is to collect them with an efficient collection system and deposit them in a compost pile. A compost pile is a collection of grass, leaves, and other organic wastes which—when properly tended—decompose into an odorless, topsoil material. This material, in turn, acts as an inexpensive fertilizer for your lawn and garden.

How to start a healthy compost pile:

- 1 Build a bin using bricks, fencing, cement blocks, etc. or purchase a prefabricated bin from a garden store. The bin should also have venting on each side and from the bottom to the top.
- 2 Fill the bin with alternating layers of yard waste. Follow this recipe:

First layer: 3-4 inches of chopped brush or other coarse material.

Second layer: 6-8 inches of mixed leaves, grass clippings, sawdust, etc. Materials should be "sponge damp."

Third layer: 1 inch of soil to add micro-organisms that help break down organic matter.

Fourth layer: 1-2 inches of manure to provide the nitrogen needed by micro-organisms.

Keep adding layers until the bin is almost full. Top off with a 4-6 inch layer of straw and scoop out a "basin" to catch rain water.

- 3 Four or five days later the pile will reach temperatures of 140-160 degrees. At this time you'll notice it settling, a good sign your compost is working properly.
- 4 After 5-6 weeks, fork materials into a new pile, turning the outside of the old heap into the center of the new one. Add water if necessary. The compost should be ready to use within three to four months when dark brown, crumbly, and earthy-smelling.

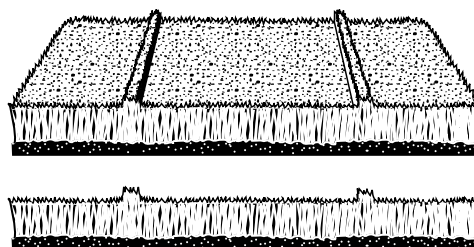


SOLUTIONS FOR COMMON MOWING PROBLEMS

Streaking

Streaking is when thin strips of uncut grass are left behind the mower. Streaking is usually caused by operator error or poor blade maintenance.

Streaking



CAUSE

Blades are not sharp
Blades are worn down too far
Engine speed is too slow
Ground speed is too fast
Deck is plugged with grass
Not overlapping cutting rows enough
Not overlapping enough when turning

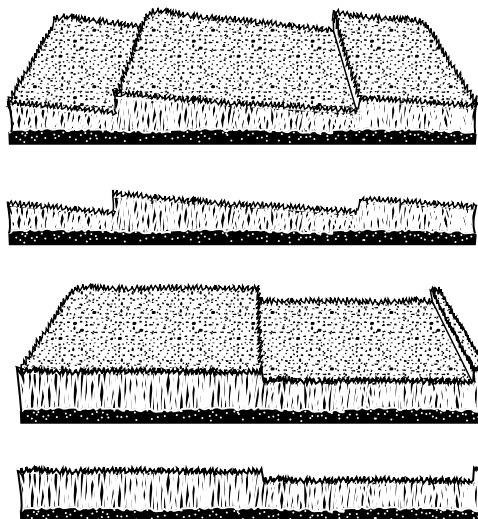
SOLUTION

Sharpen your blades
Replace your blades
Always mow at full throttle
Slow down
Clean out the mower
Overlap your cutting rows
When turning your effective cutting width decreases—overlap more when turning

Stepped Cutting

Stepped cutting is sharp ridges or uneven levels left in the lawn surface. Stepped cutting is usually caused by mower deck damage or misadjustment, or damage to mower blades.

Stepped Cutting



CAUSE

Deck is not leveled correctly
Tires are not properly inflated
Blades are damaged
Deck shell is damaged
Mower spindle is bent or loose
Blades are installed incorrectly

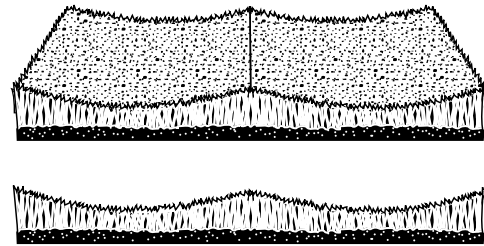
SOLUTION

Level the deck correctly
Check and inflate the tires
Replace the blades
Repair or replace the deck
Repair or replace the spindle
Reinstall the blades correctly

Uneven Cutting

Uneven cutting is waviness or smooth troughs in the lawn surface. Uneven cutting is usually caused by mower deck damage or misadjustment.

Uneven Cutting



CAUSE

Deck is not leveled correctly
Blades are dull or worn
Blades are damaged
Deck is clogged with grass clippings
Deck shell is damaged
Mower spindle is bent or loose
Blades are installed incorrectly

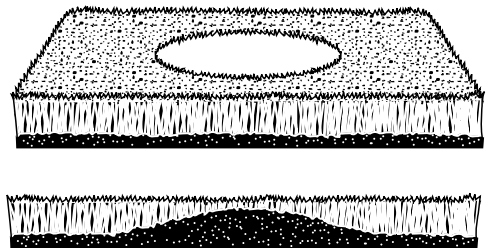
SOLUTION

Level the deck correctly
Sharpen or replace the blades
Replace the blades
Clean out the deck
Repair or replace the deck
Repair or replace the spindle
Reinstall the blades correctly

Scalping

Scalping is when the mower deck comes close to or hits the ground. Scalping can be caused by the mower deck misadjustment, unevenness in the lawn, or by mower deck bouncing because the ground speed is too fast.

Scalping



CAUSE

Lawn is uneven or bumpy
Mower deck cutting height is set too low
Ground speed is too fast
Deck is not leveled correctly
Tire pressure is low or uneven

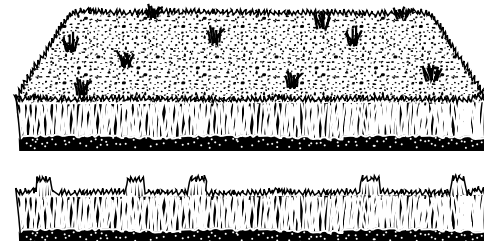
SOLUTION

Roll or level the lawn
Raise the cutting height
Slow down
Correctly level the deck
Check and inflate the tires

Stingers

Stingers are sparse patches of uncut grass left behind the mower. Stingers are usually caused by operator error or poor blade maintenance.

Stingers



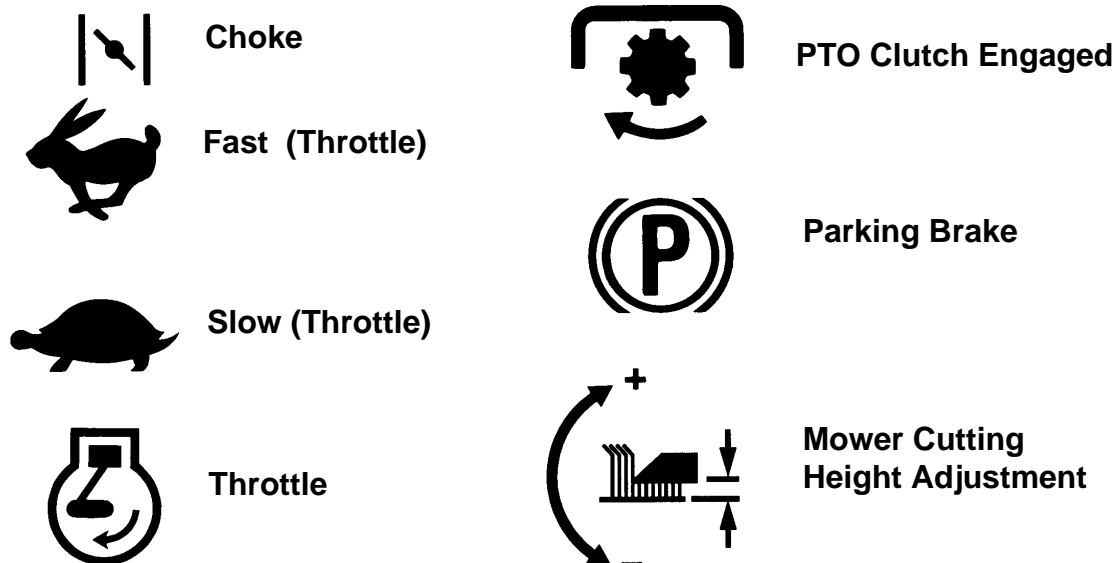
CAUSE

Blades are not sharp or are nicked
Blades are worn down too far
Engine speed is too slow
Ground speed is too fast
Deck is plugged with grass

SOLUTION

Sharpen your blades
Replace your blades
Always mow at full throttle
Slow down
Clean out the mower

Common International Symbols



Technical Manuals

Additional Technical Literature Available

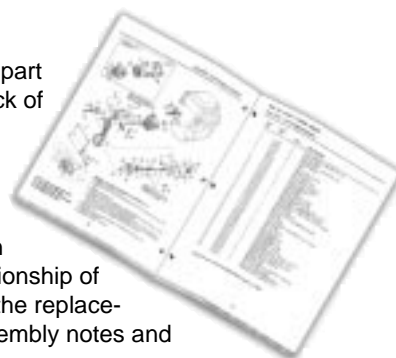


Operators Manuals

Additional copies of this manual are available, (and as part of our product support commitment, we maintain a stock of printed operators manuals going back many years!)

Parts Manuals

Fully illustrated parts manuals are also available — these manuals show all of the product's components in exploded views ("3D" illustrations which show the relationship of the parts and how they go together), as well as giving the replacement part numbers and quantities used. Important assembly notes and special torque values are included in these manuals.



For the applicable manuals currently available for your model, contact our Customer Publications Department at 414-284-8519. Have the information listed in the box at the right available when phoning in your request.

Please allow 3 to 4 weeks for delivery.



Model: _____

Mfg. No.: _____

Your Name: _____

Address: _____

City, State, Zip: _____

Visa/Mastercard No.: _____

Card Expiration Date: _____